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CONTENTS

EDITORIAL:
Editorial Notes 867
The Car Shortage and the Commission 868
Have Freight Rates Increased? 869
Baltimore & Ohio 871, 908
Chicago, Burlington & Quincy 872, 910
New Books 873

LETTERS TO THE EDITOR 874

ILLUSTRATED:
Lake Superior & Ishpeming Ore Loading Dock; by J. F. Jackson 877
The Course of Railway Rates Since 1870; by William Z. Ripley 881
The Tacheometer in Railway Location; by E. R. Lewis 889
Building Large Locomotives 890

MISCELLANEOUS:
Mechanical Handling of Baggage and Freight 879
Tests of Turpentine Substitutes 887
Handling Freight Claims on the Cincinnati, Hamilton & Dayton 887
Interstate Commerce Commission Report on Hyde Park Derailment 888
Conducting a Union Ticket Office; by B. W. Frauenthal 894
Foreign Railway Notes 876, 879, 880, 888

GENERAL NEWS SECTION 896

WE have recently, at various times, outlined the plans and the progress of the movement for the organization of a permanent "See America First Association" to carry on a systematic campaign for promoting tourist travel in this country. The letter from "A Kentuckian," published in our issue of October 18, which has elicited further comment from our readers, published in this issue, indicates some of the reasons why such a co-operative effort may be needed, as well as some of the conditions it must seek to remedy if its work is to be successful. Our correspondents have mentioned some of the causes of complaint which have been experienced by all who have traveled extensively in this country, and which must be removed before any considerations of patriotism can be expected to appeal strongly to the large class who have the leisure and means for touring, and in whom experience has developed a discrimination in such matters. It will be noted that the principal features of American travel with which our correspondents find fault are those having to do with hotel service rather than with that of railways, although "Kentuckian" does mention the "uncommunicative and surly Pullman porter." As the contemplated organization would include the hotel proprietors, the opinions voiced by our readers may serve to indicate some of the most effective ways in which their co-operation may be exerted. As Mr. Busch concisely puts it, "something much more fundamental than advertising will have to be done in this country to make the slogan 'See America First' effective."

IN our railroad construction news column recently there was mention of improvements that are being made on the Bald Eagle Valley branch of the Tyrone division of the Pennsylvania Railroad. When these improvements are completed it is estimated that it will be possible to haul 4,550 tons eastbound, as compared with 3,000 tons, the present rating. With this increased tonnage rating, the Bald Eagle Valley branch pretty surely will soon have a greater freight density than any other single track line of equal or greater length in the United States. When B. A. Worthington was receiver of the Wheeling & Lake Erie he pointed out that for the month of July, 1910, the number of ton miles per mile of road on the Wheeling & Lake Erie between Brewster and Pittsburgh Junction was at the rate of 6,368,232 tons per year. From Pittsburgh Junction to Brewster is 47.6 miles, and there are three scheduled passenger trains each way a day. The Bald Eagle Valley branch is 87.5 miles long, of which, however, but 54.2 miles is main line, and on this 54 miles of line there are four scheduled passenger trains each way a day. During the first eight months of the calendar year 1912 the average tons one mile per mile of road on the entire 87.5 miles per month was 504,444, or at the rate of 6,053,328 per year. If the tonnage rating eastbound is now to be increased by over 50 per cent., and, of course, the great bulk of the tonnage moves east, it should be conservative to estimate that the total ton miles will be increased by 20 per cent., which would give a freight density of over 7,000,000 ton miles per year. If there is any other single track line in the country of 75 miles or over that has as heavy a density as this, and also operates as many passenger trains, we do not know of it.

THE recent authorization by one important road, of the bridge work to be included in its construction program for next season, recalls the fact that this practice is not as common as it should be. Bridge gangs are already at work on these contracts and by spring it will be possible for grading to be undertaken without any delays due to unfinished roadbed openings. It is only too common for authorizations for construction and betterments to be withheld until the last moment and then to be accompanied with instructions to rush the work in order to complete it at the earliest possible date. It frequently happens that contracts for grading and masonry are let before the right-of-way is secured and sometimes even before the location of the line has been definitely settled. As a result of this practice, grading forces are frequently delayed waiting for the land to be secured and for the bridge gangs to complete culverts and other roadbed openings. The bridge gangs are often delayed until material can be diverted from other work and a great deal of needless expense and delay results from the moving back and forth of men and materials between the various undertakings. As long as the making of improvements and the building of additional lines is so dependent on immediate earnings, perhaps little relief can be expected, but the condition existing on too many roads inevitably results in confusion and increased cost of construction and improvement. When it is necessary to secure right-of-way for immediate work, excessive prices may often have to be paid for it when it could have been secured at a fair price by condemnation proceedings or litigation if there had been sufficient time. The appropriations necessary for right-

of-way and bridge work are only a small proportion of the total cost of improvements or new lines, and if these items are authorized well in advance of the other construction work, very costly delays can be eliminated.

THE prohibition of common drinking cups, which has been promulgated by the Treasury Department of the Federal Government, is more sweeping than anything of the kind that we ever saw. It applies not only to all cars which may carry interstate passengers, but to every little station where such passengers may have occasion to wait for a train. If the danger of transmitting germs of disease really is great, this will be a great reform. But in the nature of things there will never be a particle of evidence as to the number of lives saved, and so the maintenance of a strict and continuous compliance with the law will depend on eternal vigilance in adhering to a theory. We are all so frequently swallowing or inhaling dangerous germs, knowingly, that to expect experience to confirm us in the spirit of obedience to the law, as a health measure, is idle. As was suggested last week, it remains true that the water itself may be more dangerous than the cup from which it is sipped, so that this law becomes one more illustration of how much easier it is for a Pharisee, or a lawmaker, to cleanse the outside of a platter (or a cup) than to attack evils at their heart. But, aside from the question of health, the cultivation of neatness is always to be commended and the railways will not be averse to doing their part in getting rid of the common cup. Like the moss-covered bucket of the poet, it is often offensive when not dangerous. But whether the railways' part should include the furnishing of millions of paper cups is a question. Many persons now carry pocket cups, and those who do not ought to pay. One cent, however, is too high a price, and therefore to make an equitable arrangement is not easy. At stations it would be possible, of course, to comply with the Treasury order by providing a metal cup and a pot of boiling water in which to sterilize it; but practically anything of that kind is out of the question. By the way, do dining car stewards always wash their tumblers and goblets in boiling water? If they do not, they must now watch out for government inspectors!

WIDESPREAD publicity was given to various reports regarding the cause of the wreck of the Twentieth Century Limited of the New York Central Lines at Hyde Park, N. Y., on March 31 last. The report of the Interstate Commerce Commission on this accident, which is reviewed briefly on another page in this issue, is of interest largely because of its agreement with the report of the New York Public Service Commission, issued about three months ago, attributing the wreck to unevenness of track resulting from the action of frost, together with the weakening of the track, due to the use of shims. It appears from these reports that severe heaving had been noticed for some time before and that the regular section forces had applied shims which weakened the track enough to permit the rails to spread under the train moving at high speed. Although, theoretically, any use of shims raising the rail away from the tie is objectionable, because it lessens the holding power of the spike in the tie and also decreases its resistance to bending, in practice such shimming is necessary as a temporary expedient to maintain smooth track until the frost leaves the ground. It would appear from the report that every precaution possible had been taken to insure the safe condition of the track. It is stated that section forces had placed shims in it on the day before the wreck; and it is to be supposed that they left it in proper surface. A trackwalker had passed over the track within a half hour before the accident without noting any defective conditions. A standing order limiting speed to 60 miles an hour was also enforced on this division at this time, and the evidence shows that the train was probably running not to exceed 50 miles an hour when the accident occurred. It would appear that the wreck was a direct result of physical conditions which were guarded against as effectively as possible, but which cannot be entirely in all cases, especially in such severe weather as was encountered last winter. In view of the fact that the Interstate Commerce Commission and the New York Public Service Commission agree that the broken rail was not the cause of the wreck, but one of its results, and that Mr. Howard also states that the rail was of good quality and did not have defects such as were found in the Great Northern and the Lehigh Valley, rails which caused bad accidents, it is surprising to find him repeating his former statements regarding laminated seams in the base and that present specifications do not detect this type of failure. The wreck not having been caused by the failure of the rail—the rail having, in fact, been found to be practically sound when broken—what has Mr. Howard's theory as to the cause of rail failures to do with this accident? The logician who can get evidence in support of his theory as readily from events that have no relation to it as from those that have must be conceded to be resourceful, but can hardly be accepted as reliable.

THE CAR SHORTAGE AND THE COMMISSION.

THE last fortnightly car statement of the Committee on Relations Between Railways, showing the car situation on October 24, fully justifies the action taken by the railways last August in giving warning that a severe shortage of railway facilities and congestion of traffic were impending, and appealing to shippers and consignees to co-operate with the carriers in efforts to avert a bad situation, or at least to keep it within as narrow bounds as possible. The freight car surplus on October 24 was 17,289 and the shortage 67,270, leaving a net shortage of 49,981 cars. This fulfills the forecast made by the railway managers that the car shortage this fall would be the largest since 1907. On October 16, 1907, the surplus was 4,258, and the shortage 85,764, making a net shortage of 81,506; and on October 30, 1907, the surplus was 3,946 and the shortage 90,757, making a net shortage of 86,811.

It will be seen that the situation is not nearly as bad as it was in 1907. It has not been and is not now as bad as many anticipated it would be this fall. Since 1907 the railways have made many improvements in their terminals and operating methods. Furthermore, they have received thus far this fall the best co-operation from shippers and consignees that they have ever been given. The early agitation of the subject caused many to make shipments in August, September and the early part of October which otherwise would have been held back. Weather conditions thus far also have been as favorable as possible. In consequence, the roads up to date have been able to deal with the heaviest traffic in their history in a way which, while not satisfactory to either them or their patrons, has been a very great improvement over the way in which the business was handled in the fall and winter of 1906-'07, and before the panic in the fall of 1907. There is still an enormous tonnage in the country to be moved; and heavy snow followed by freezing cold, or a relaxation of the efforts on the part of either the railways or the shippers and consignees to get the maximum ton mileage out of every car every day might yet bring about a condition that would be very bad for everybody.

At this juncture the Interstate Commerce Commission has taken a hand by issuing a statement to railways and shippers which has been given wide publicity. We present the Commission's statement elsewhere. It says that "While the railroad systems of the country as a whole are adequately supplied to meet reasonable demands, it has been the policy of some carriers to rely in times of car shortage upon the equipment built for and owned by their connections." The consequence is, that some roads have an apparent shortage of equipment, not because they have not provided enough of it, but because other roads have got and are keeping possession of it. The Commission recommends, as a remedy, an increase in the per diem rate. It is strange it does not mention in this connection that

the roads have already decided on this very remedy, and will apply it on January 1. The per diem rate will then be raised to 45 cents. Five years ago it was but 25 cents.

The Commission also recommends that "Operating officers be instructed to make fuller use of locomotives and cars by increasing the speed of freight trains." It adds "that an average movement of less than 25 miles per car per day is not adequate to the need of a time such as this." The first criticism to be made on this recommendation and the statement regarding the average car movement is that an increase in the speed of freight trains will not necessarily cause an increase in the average movement of freight cars per day. The critical point in railway operations is the terminal. This is where delays to cars occur; and under conditions of congestion an increase in the speed of freight trains on the road might so increase congestion at terminals as to reduce car mileage per day. Cars at terminals are in the hands of shippers a great part of the time. In its statement the Commission says that it has received no general complaints that shippers are not acting with reasonable energy in loading and unloading cars. But slow movement of cars raises just as much, and no more, of a presumption that their handling is not being expedited as much as it can be by the shippers as that it is not being expedited as much as it can be by the railways. The second criticism to be made on the commission's comment on car movement is that *car miles per day* is not the measure of freight car efficiency. The true measure is *ton miles handled per freight car per day*. The figures relative to ton miles handled per freight car per day show a marked increase in freight car efficiency during the last five years. The latest figure on this point available is that for July, 1912. In July, 1907, the average ton miles per car per day (excluding surplus cars) were 343; and in July, 1912, 362. The average in March, 1908, was 348, in March, 1910, 395; and in March, 1912, 397.

The Commission in forcible language calls attention to the dangers of the present situation. It warns shippers and railways that they must do their best to make the most economical and efficient use of existing equipment. Two years ago the rate advance cases were pending, railway managers were then appearing before the Commission and telling it, backing their statements up with detailed statistics, that unless they were allowed higher freight rates the railways would be unable to provide enough facilities to handle the commerce of the country. The Commission disallowed the advances. It predicted that the earnings of the railways would be higher in 1911 than in 1910, and that with the existing rates they would be able to provide adequate facilities. The net earnings of the railways did not increase. They were less in the fiscal year 1911 than in the fiscal year 1910; and they were less in the fiscal year 1912 than in the fiscal year 1911. About the end of the fiscal year 1912 industrial conditions sharply changed; and there came with a rush an enormous increase in traffic. The resulting condition on the railways is precisely what the railway managers predicted two years ago, but which the Commission absolutely refused to foresee. And now the Commission, ignoring its own great responsibility for the situation, lectures the managers before the country because they, or part of them, have not provided enough equipment. It may be said that if some roads have made enough provision for handling their business all could have done so. But there is just as much difference in proportion between the financial resources of different railways as between those of different men.

If the Commission desires to deal with real effectiveness with car shortages, instead of sending academic statements to the press about them when it is too late to prevent or greatly mitigate them, it might put in its time pondering the following language used by its present chairman in an oft-quoted address at Yale University in 1909: "We can provide by legislation the sort of cars which a railroad shall use and the rates which it shall impose; we cannot by legislation force one single dollar of private capital into railroad investment against its will. . . . This phase of the matter is too little considered. If this government hopes to continue its present system; if we are to look in the future as in the past to private capital for the providing of our railroad transportation, it is fundamentally necessary that confidence in the fair treatment of that capital shall be established."

HAVE FREIGHT RATES INCREASED?

THE main thesis of the article by Professor Ripley in this issue is that past changes in the receipts per ton mile do not accurately indicate the general tendencies of freight rates in the United States. Incidentally, Mr. Ripley contends that there was a "strongly marked upward tendency" of rates during the decade from 1900 to 1910. As Professor Ripley points out, the differences in the average distances that goods are hauled, in the natures of the traffic handled, and in other factors often are so great as to vitiate comparisons of ton mile revenue. But we believe the variations in the average revenue per ton mile that has been received from year to year by the railways of the United States as a whole, do reflect with approximate accuracy the variations that have taken place in their absolute rates.

The average revenue per ton mile declined from 9.41 mills in 1890 to 7.29 mills in 1900, or 22 per cent. It increased from 7.29 mills in 1900 to 7.53 mills in 1910, or 3.3 per cent. Professor Ripley agrees that, as the ton mile revenue indicates, there was a rapid decline in rates between 1890 and 1900. That period may, therefore, be dismissed from consideration. Let us, then, examine the available evidence as to whether, in spite of the fact that average receipts per ton per mile increased only 3.3 per cent., there was a "strongly marked upward tendency during the last decade."

The receipts per ton mile from a long haul are ordinarily less than from a short haul. Therefore, other things being equal, an increase in the average haul would reduce the average receipts per ton mile, and *vice versa*. The typical haul of the average railway in 1900 was 130.87 miles, and in 1910, 138.31 miles. The typical haul of all railways in the former year was 242.73 miles, and in the latter, 249.68 miles. The figure for 1900 included the hauls on switching and terminal railways, and that for 1910 did not. This would tend to cause a nominal increase in the average haul. Furthermore, it is dangerous merely to compare figures of one year with those of another. The figures of any one may be affected by highly special conditions. How misleading such comparisons may be is shown by the fact that while there was an apparent increase in the average haul in 1910 as compared with 1900, the average haul in 1901 was 251.98 miles, and in 1909, 251.10 miles, almost exactly the same. On the whole, the evidence indicates that there was a small increase in the average haul. This, other things being equal, would have slightly reduced average receipts per ton mile. But, as we have seen, these receipts increased. This, taken alone, indicates that there was a greater increase in the absolute rates than in the average receipts per ton mile.

Secondly, other things being equal, the average receipts per ton per mile will be increased by a relative increase in the ton mileage of traffic paying more, and reduced by a relative increase in the ton mileage of traffic paying less, than the average. It is not possible to present figures showing the relative increases between 1900 and 1910 in the ton mileages of different classes of commodities. The Interstate Commerce Commission gives the percentages that the tonnages of different classes of commodities bore to the total tonnages handled. The following table presents these figures for 1900 and 1910:

	Per Cent. Total Tonnage. 1900.	Per Cent. Total Tonnage. 1910.
Products of agriculture	10.35	8.13
Products of animals	2.87	2.10
Products of mines	52.59	56.23
Products of forests	11.61	11.67
Products of manufactures	13.41	14.42
Merchandise	4.26	3.69
Miscellaneous	4.91	3.76
	100.00	100.00

Of the classes of commodities mentioned, miscellaneous articles, merchandise, manufactures and animals pay higher

than average rates, products of forests slightly less than average rates, products of agriculture still less, and products of mines constituting more than half of the tonnage, very materially less. Therefore, the relative decreases in the tonnages of miscellaneous and merchandise, products of agriculture and products of animals would tend, other things being equal, to reduce the average receipts per ton per mile, the increase in the relative tonnage of products of mines would exert an influence in the same direction, while the increase in manufactures would tend to pull the average up, provided that the average hauls of these different classes remained relatively the same. As we have seen, however, the evidence tends to indicate that there was a small increase in the average haul. This increase, if there was one, it is safe to surmise, took place in the movement of the higher grades of commodities. This being true, the effect of the relative decrease in the tonnage of commodities paying more than average rates was at least partially offset by an increase in the average distances that they moved.

The Interstate Commerce Commission gives some figures of average receipts per ton per mile derived from the transportation of commodities handled in carload quantities which would throw much light on the subject if they went back far enough and included all railways. Unfortunately, the commission first gave these figures in 1908, and they represent the results on only from 100,000 to 130,000 miles of road. However, they do more or less indicate the tendency of rates during the three years, 1908 to 1910, inclusive, and we, therefore, give them below for these years:

Commodity.	Average receipts per ton per mile—Cents. 1908.	1909.	1910.
Grain	.595	.611	.630
Hay	.957	1.025	1.019
Cotton	1.743	1.781	1.823
Live stock	1.182	1.166	1.217
Dressed meats	.889	.905	.904
Anthracite coal	.589	.603	.611
Bituminous coal	.495	.512	.498
Lumber	.727	.770	.734

All of the foregoing figures indicate a slight upward movement in rates between 1908 and 1910; but in four out of eight cases the average receipts were less in 1910 than in 1909.

In his article Professor Ripley refers to certain specific rates, the changes in which were taken by Professor John R. Commons as typical of the changes which took place in rates in general between 1890 and 1900. Professor Ripley rejects the changes in these rates since 1910 as typical for reasons given in this article. There can be no question as to the soundness of the ground on which he excludes from consideration the rates on petroleum which were included in Professor Commons' rate index. It seems to us questionable, however, if he is justified in rejecting the other rates used by Professor Commons. We, therefore, give them below for the years, 1890, 1900 and 1911:

From	To	Commodities.	Rate per 100 lbs.—Cents. 1890.	1900.	1911.
New York	Chicago	*Dry goods	75	75	75
		*Cotton piece goods	50	57	55
		Furniture, C. L.	65	65	50
		Crockery, C. L.	30	30	30
		Sugar, L. C. L.	35	39	40
		Sugar, C. L.	25	30	26
		Castile soap, L. C. L.	65	42	40
		Common soap, C. L.	30	35	30
		Lead, C. L.	25	25	17½
		Bagging (cotton) L. C. L.	50	50	55
New York	St. Louis	*Dry goods	87	87	88
		Agr. implements, C. L.	35	35	35
		Cotton piece goods	58	66	65
		*Furniture, C. L.	75	75	76
		Bagging (burlap or gunny) C. L.	41	41	35
		Lead, C. L.	29	29	20
Chicago	New York	Cattle, C. L.	23	28	28
		Hogs, C. L.	28	30	30
		Sheep, C. L.	30	30	30
		Horses and mules, C. L.	60	60	60
		Dressed beef, C. L.	39	45	45
		Wheat, C. L. (on shipments from beyond)	14.3	10	16
Chicago	St. Paul	*Dry goods	48	60	60
		Coffee, C. L.	15	20	20
Chicago	Kansas City	*Dry goods	66	80	80
		*Cotton piece goods	44	50	50
Chicago	St. Paul	Hard coal, C. L., per ton of 2,000 lbs.	$2.50	$2.50	$2.00
Wyoming region	Buffalo	Anthracite coal (coal or box cars), per ton of 2,240 lbs.	$2.00	$2.00	$2.00
Clearfield region	Philadelphia	Bituminous coal, per ton of 2,240 lbs.	$2.00	$1.36	$1.60
Clearfield region	Baltimore	Bituminous coal, per ton of 2,240 lbs.	$2.00	$1.36	$1.60
Clearfield region	Jersey City	Bituminous coal, per ton of 2,240 lbs.	$2.25	$1.61	$1.85
Wyoming region	Philadelphia	Anthracite, per ton of 2,240 lbs.	$1.75	$1.55	a$1.80
Lehigh region	Philadelphia	Anthracite, per ton of 2,240 lbs.	$1.70	$1.55	a$1.75

* Any quantity.
a This rate applies via canal and is suspended during winter.

It will be seen that of the foregoing rates, 10 were higher in 1911 than in 1900, 10 lower and 13 the same.

The conclusion to which examination of the foregoing evidence leads is that, as indicated by the change in the average receipts per ton per mile, there has been a slight increase in rates since 1900. The increase in the absolute rates may have been a little greater than that in the average receipts per ton per mile; but advance since 1900 certainly has been incomparably less than was the reduction between 1890 and 1900, and does not, in our opinion, justify Mr. Ripley's statement that there has been a "strongly marked upward tendency during the last decade."

It is only fair to note in this connection, that the receipts per ton mile in 1900, amounting to 7.29 mills, were the lowest in the history of American railways, except in 1899, when they were 7.24 mills. Therefore, the comparison with 1900 is almost the hardest it is possible to make. In 1898 the average receipts were 7.53 mills—exactly the same as in 1910. Another point which should be noted is that after 1900 there was a rapid recovery of the receipts per ton mile and that they rose in 1904 to 7.8 mills, which is higher than they ever have been since. Also, prior to 1906, departures from the published tariffs were common while since they have been extremely uncommon. This change alone tends to increase ton mile receipts. On the other hand, soon after the Hepburn act went into effect, numerous reductions were made in the published rates to secure to shippers part of the benefits they had previously derived from rebates. To what extent this offset the effect on ton mile receipts of the abolition of rebating it is impossible to say.

Finally, there have been, during the last decade, large increases in prices and wages, including those that railways have to pay for their materials and to their labor. In March, 1910, according to the United States Bureau of Labor, wholesale prices were 33.8 per cent. higher than the average prices for the decade, 1890 to 1900. The increase in the wages of railway employees has been in proportion. Therefore, while there was some absolute increase in rates, there was, as compared with prices and wages, a reduction in them of at least 25 per cent.

So much for freight rates. The railways also derive a considerable part of their revenue from the transportation of passengers; and there was, meantime, not only a comparative, but an absolute reduction in passenger rates, from 2.008 cents in 1900 to 1.938 cents in 1910, or 3.5 per cent.

The opinion that there has been a general and substantial increase in freight rates is one that prevails widely. Why is this so when the evidence shows that the belief is incorrect? The explanation is not difficult. When the railways try to make a general advance in rates, or indeed, any advance at all, there is always a struggle, the news of which is published and discussed throughout the country. There are always going on innumerable isolated reductions in every section, some of which are ordered by the Interstate Commerce Commission, but most of which are made voluntarily by the railways for competitive reasons or to develop industries. These, year after year almost, or entirely, or more than entirely, offset the advances; but very

little is published or said about them, because they lead to no conflicts and there is no element of sensationalism in them. As most people hear nothing about the reductions and hear a great deal about the advances, or attempts at advances, they naturally think that the latter are much more numerous, or indeed, are practically the only changes ever made.

BALTIMORE & OHIO.

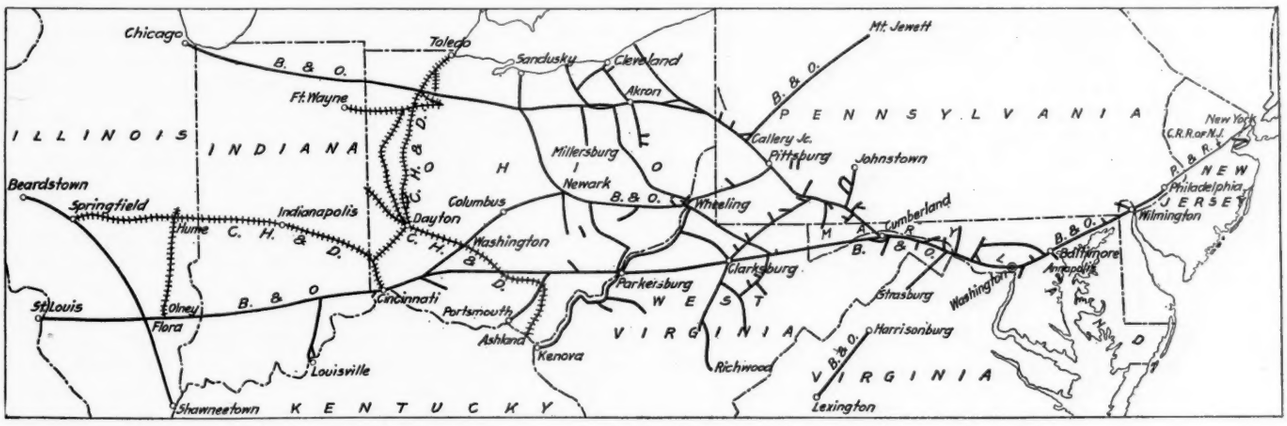
IN the fiscal year ended June 30, 1912, the revenue from freight per freight train mile on the Baltimore & Ohio was $3.2168, or an increase over 1911 of over 26 per cent. This increase in revenue per train mile was made despite the fact that there were slight decreases in freight rates on certain commodities with no increases. The average ton mile rate, it is true, was slightly higher in 1912 than in 1911, being 5.80 mills in 1912 and 5.78 mills in 1911, the average increase being due to a heavier tonnage of high grade freight being carried in 1912 than in 1911. This increase in high grade tonnage is probably to be credited to the traffic department; but the greater part of the increase in earnings per freight train mile is due to the more economical operation of the road. The increase in efficiency of plant and of operating force, indicated by this increase of over 26 per cent. in earnings per train mile, is one of the most remarkable demonstrations of what effect the personality of one man can have on the organization of a great railroad property and on its earning power that the recent history of American railroading affords.

In 1907 the Baltimore & Ohio, operating 4,462 miles, carried 12,246,000,000 revenue ton miles and ran 28,013,000 revenue freight train miles with 34,855,000 freight locomotive miles having an average train load of 437 tons. In 1912 the mileage operated was 4,455 miles, the revenue ton mileage was 12,490,000,000, the revenue freight train mileage was 22,527,000, with 28,369,000 locomotive miles and the average train load was 544 tons. The train load in 1912 was greater by nearly 114 tons—over 25 per cent.—than in 1911. There was an increase in 1912 over 1911 of 6.86 per cent. in tons carried and of 6.72 per cent. in ton mileage, with actually a decrease in transportation expenses.

It was three years ago that Daniel Willard became president of the Baltimore & Ohio, and at the time he took the property its fixed charges were $2,615 per mile and its net income per mile, after payment of these charges, was $3,011. During these three years fixed charges have increased to $2,934 per mile, and after paying these increased fixed charges, there was last year a net income of $3,120 per mile. The extraordinary operating results achieved in 1912 are the outcome of the policy adopted three years ago of improving the plant and the efficiency of the organization in the face of the refusal of the Federal commission to grant higher rates and in the face of a prospective business depression. The courage displayed in carrying out this policy seems amply justified by the showing made in 1912.

Total operating revenues amounted to $92,594,000, an increase over 1911 of $4,449,000. Operating* expenses amounted to $27,885,000 in 1912, and to $25,379,000 in 1911; and after the payment of rentals and interest charges (amounting to $512,000 more in 1912 than in 1911), and after a decrease in other income of over $500,000, due to a decrease of $548,000 in "other interest" received by the company, the B. & O. earned net $13,898,000, or $1,078,000 more than in 1911. The ratio of expenses to total operating earnings was 69.88 per cent. in 1912, as against 71.21 per cent. in 1911. The ratio of total maintenance expenses, including both maintenance of way and maintenance of equipment, was 30.26 per cent. of total operating revenues in 1912, as against 29.57 in 1911; while the ratio of transportation expenses to total operating revenues was 35.37 per cent., as compared with 37.23 per cent. the year before.

The Baltimore & Ohio is a road with a very heavy freight density and with a large proportion of its freight traffic furnished by bituminous coal. The ton miles per mile of road in 1912 averaged 2,804,000, and in 1911, 2,640,000. The tonnage of bituminous coal last year totaled 29,985,000 tons, or 46.34 per cent. of the total tonnage carried. The tonnage of this commodity was more in 1912 than in 1911 by 2,687,000 tons. All products of mines, including coal, furnished 66.63 per cent. of the total tonnage in 1912; products of manufactures furnished 15.71 per cent.; products of agriculture furnished 4.95 per cent.; products of forests, 4.06 per cent.; merchandise (L. C. L.), 3.23 per cent., and products of animals, 1.45 per cent., with miscellaneous carload tonnage, 3.97 per cent. The principal gains in tonnage in 1912 over 1911 besides those made in the tonnage of products of mines are petroleum and other oils, bar and sheet metal, and miscellaneous manufactures.



The Cincinnati, Hamilton & Dayton, controlled by the B. & O., is shown by the crosshatched line.

The Baltimore & Ohio.

In our comments on the Baltimore & Ohio's report for 1911 mention was made of the improvement work that was being carried on, and the engineering features of this work have been described from time to time in the *Railway Age Gazette*. It is only necessary to recall here that the lack of facilities east of Cumberland, and on the Connellsville division immediately west of Cumberland, had limited the capacity of the entire line. During the year the change of line and reduction of grade between Blaser and the west end of the Kingwood tunnel, including the construction of a double-track tunnel, has been completed and put in operation. Additional yards have been built at a number of places; 42 miles of second track have been added; third and fourth track have been added on the Cumberland and Connellsville divisions where congestion was worst; 12 new interlocking plants have been built and seven rebuilt, and other

*The increase in expenses was due almost entirely to increased expenditures for maintenance, transportation expenses having decreased slightly.

changes too numerous to mention have been made. It is expected that the 4,000 ft. tunnel through the Allegheny mountains at Sand Patch will be completed by January 1, 1913, and when this is in operation there will be double track all the way from Philadelphia to Chicago, with the exception of about 34 miles on the Chicago division.

The only important financing that was done during the year was the sale of $10,000,000 equipment trust certificates. The loans and bills receivable, however, were called in by the company to the extent of $12,585,000, leaving but $6,167,000 loans and bills receivable at the end of 1912. This calling of loans explains the reduction of over $500,000 in "other interest" received by the B. & O. mentioned previously. Cash on hand at the end of 1912 amounted to $9,263,000, which is more by $1,724,000 than the amount on hand at the end of 1911. Total working liabilities amounted to $12,098,000 at the end of 1912, which is more by $2,324,000 than working liabilities at the end of 1911, due almost entirely to an increase of $2,185,000 in audited vouchers and wages unpaid.

During the year the company spent on additions and betterments $11,976,000, and the annual report shows in detail and in the form which the company is required to use in reporting to the Interstate Commerce Commission the accounts for which this amount was spent. The principal amounts were $1,322,000 for purchase of property; $1,701,000 for grade reductions and changes of line; $2,340,000 for additional main track; $1,478,000 for sidings and spur tracks, and $1,655,000 for terminal yards. In addition to these expenditures to road there was $7,586,000 spent on capital account for equipment. The new equipment added during the year included 105 locomotives, 78 steel passenger cars, and 3,814 new and 1,400 reconstructed freight cars.

There is one point mentioned by President Willard in his comments on the annual report which is rather interesting. He mentions the fact that by the use of special educational trains, demonstrators and lecturers from the experiment stations of states through which the road runs were brought in contact with 22,000 farmers during the year; and the B. & O. with more than half its tonnage furnished by products of mines and only 5 per cent. by products of agriculture, decided that it was worth while to appoint an agricultural agent to take charge of the agricultural interests of the railroad and to aid in the development of the agricultural possibilities in the territory served.

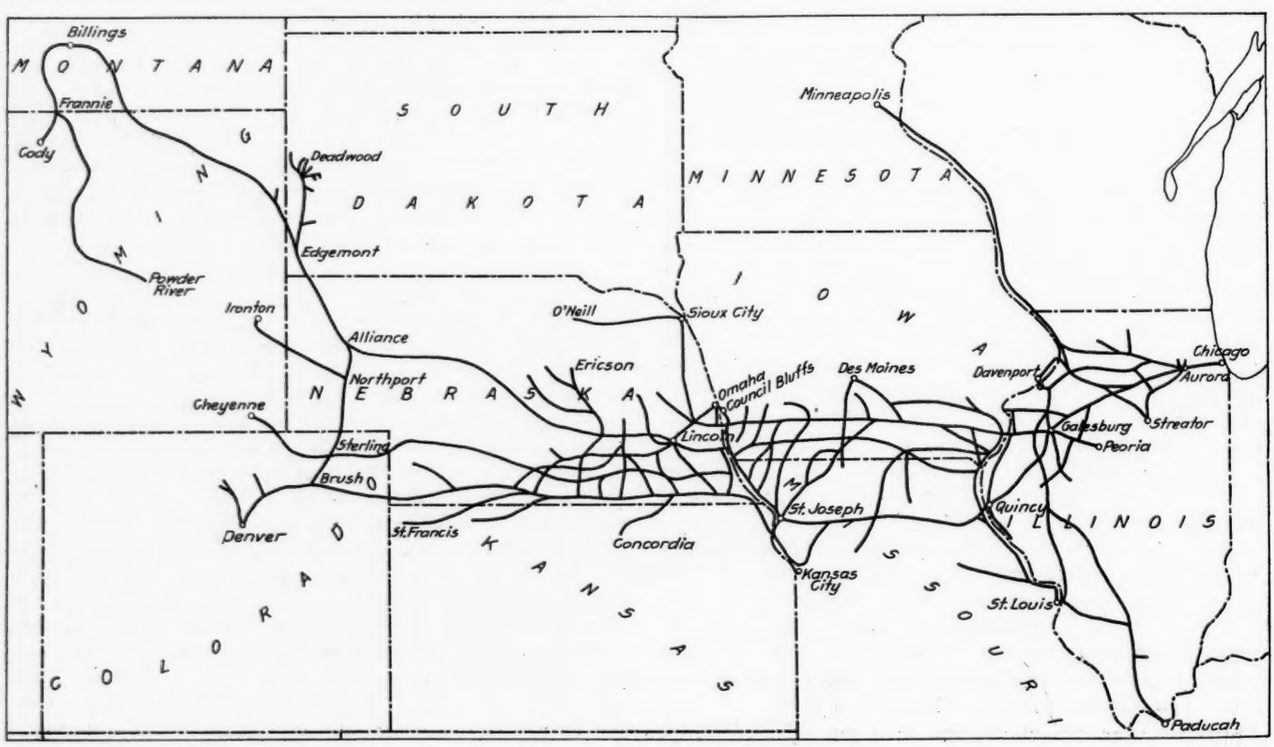
The following table shows the principal figures for operation in 1912, as compared with 1911:

	1912.	1911.
Mileage operated	4,455	4,434
Freight revenue	$72,465,544	$67,629,937
Passenger revenue	14,754,912	15,208,432
Total operating revenues	92,594,323	88,145,004
Maint. of way and structures	11,365,454	10,279,616
Maint. of equipment	16,651,534	15,881,620
Traffic	1,950,999	1,948,966
Transportation	32,751,234	32,818,500
Total operating expenses	64,709,538	62,766,067
Taxes	2,984,948	2,596,250
Operating income	24,233,197	22,634,375
Gross corporate income	28,624,103	27,530,973
Net corporate income	13,898,058	12,819,991
Dividends	11,476,131	11,476,145
Surplus	2,421,927	1,343,846

CHICAGO, BURLINGTON & QUINCY.

FROM more than one point of view the Burlington may be called the Lake Shore of the West, and especially is this so in regard to its policy of paying for additions and betterments out of income. In the last five years the Chicago, Burlington & Quincy has spent from income $17,595,000 for additions and betterments. This in addition to heavy expenditures made toward betterment of the property and charged to capital account. In the fiscal year ended June 30, 1912, there was $5,899,000 spent for road and equipment betterment and charged to capital account, and $3,944,000 spent for additions and betterments and charged to capital account. The result of these expenditures, together with the very liberal expenditures for maintenance, has been that the Burlington now has one of the best physical plants of any railroad west of Chicago.

In 1912 the company, operating 9,074 miles of line, earned $86,723,000; in 1911 the company, operating 9,072 earned $88,272,000. Operating expenses were a little higher in 1912 than in 1911, so that after the payment of these expenses and of taxes, there was $22,650,000 operating income, as against $25,574,000, the operating income in 1911. After the payment of rentals and interest on funded debt and payments toward the sinking funds, there was $14,107,000 available for dividends, as against $16,844,000 at the end of 1911. Of the total available for dividends, $3,944,000 was appropriated for betterment, $8,867,000 was paid in dividends, and a surplus of $1,295,000 was shown for the year.



The Chicago, Burlington & Quincy.

In 1912 the operating ratio was 69.93 per cent., as compared with 67.45 per cent. in 1911. The ratio of transportation expenses to total operating revenues was 33.47 per cent. in 1912 and 32.34 per cent. in 1911. The ratio of total maintenance expenses, including both way and equipment, was 32.09 in 1912 and 30.77 in 1911. Notwithstanding the fact that the Burlington has a large proportion of branch line mileage, its freight density in 1912 was 845,900 ton miles per mile of road. This compares with 784,400 ton miles per mile of road in 1911. There is also a heavy passenger density, the passengers carried one mile per mile of roal totaling 121,300 in 1912 and 129,400 in 1911. Notwithstanding this heavy density of business, total operating revenues per mile of road were $9,557 in 1912 and $9,730 in 1911.

For the first time the Burlington gives in its annual report a classified list of its tonnage. In 1912, of the total 30,112,000 tons carried, 41.61 per cent. was furnished by products of mines, 19.90 per cent. by products of agriculture, 15.42 per cent. by manufactures, 7.89 per cent. by products of animals, 6.69 per cent. by merchandise (L. C. L.), 6.33 per cent. by products of forests and 2.16 per cent. by miscellaneous products. Of the total 12,528,000 tons of products of mines carried, 8,782,000 tons originated on the Burlington and the remainder was received from connections. About four-fifths of the tonnage of agriculture carried originated on the lines of the Burlington, and of the 1,830,000 tons of live stock carried, 1,635,000 tons originated on the Burlington. Of the total tonnage of all freight, almost exactly two-thirds originated on the Burlington and one-third was received from connections.

Although freight revenue was less in 1912 than 1911, as will be seen by the table at the end of these comments, and passenger revenue was less by over one and a half million dollars, the total number of tons carried in 1912 was greater by 6.3 per cent. than the tonnage carried in 1911, and the total number of passengers carried was greater by 1.8 per cent. The average haul per ton was 255 miles in 1912 and 251 miles in 1911, and the average haul per passenger was 49 miles in 1912 and 53 miles in 1911. The average receipts per ton per mile were 7.53 mills in 1912 and 8.16 mills in 1911. This is the lowest ton mile rate ever shown by the Burlington. The average receipts per passenger per mile were 1.915 cents in 1912 and 1.922 cents in 1911.

If any one will follow closely the cases decided by the Interstate Commerce Commission from day to day they will find that the overwhelming majority of these cases are either a refusal on the part of the commission to reduce a rate complained of by the shipper because the rate now in effect is obviously low enough, or a granting of reparation to the shipper or a reduction of rates. Possibly no one of these reductions over a series of months is important enough to affect any great volume of traffic; but taken in the aggregate, this continual pecking at a rate here and a rate there by the federal commission, combined with the reductions forced on roads by state commissions in state rates, and combined further with the reductions in interstate rates, practically compelled by the reductions in state rates, has a very considerable effect on the average rate received by railroads—and this is especially true of the Burlington.

To offset this as far as possible, the management of the Burlington has had to rely on what it could do in increasing its operating efficiency. In 1912 there were 7,676,000,000 ton miles carried, which is an increase over 1911 of 560,000,000 ton miles, amounting to 8 per cent. Freight locomotive mileage in 1912 totaled 18,376,000, an increase of 37,000 miles less than 1 per cent. The average train load was 438 tons in 1912, as against 406 tons in 1911. There was a slight increase in the number of loaded cars per train; but the increased train load is largely accounted for by better carloading, the average number of tons per loaded car being 18 in 1912 and 17 in 1911.

The gains in operating efficiency are even more strikingly brought out by a comparison over a series of years. In 1901 the Burlington handled 3,871,000,000 ton miles. The 1912 ton mileage is nearly double this figure. In 1901 the train mileage was 19,315,000; in 1912, 17,554,000, or 9.1 per cent. less—in a year in which 98.3 per cent. more ton mileage was handled. Twice the ton mileage was handled in 1912 as was handled in 1901, with an increase of 16.5 per cent. in road mileage. On the other hand, as an illustration of what the Burlington has been doing to improve its property, it may be mentioned that additional (second, etc.) tracks, yard tracks and spur tracks have been increased since 1901 by 61.3 per cent.

Capital liabilities at the end of 1912 were greater by only $44,000 than at the beginning of the year, and during the year funded debt held in the treasury increased from $9,318,000 to $10,626,000. The total amount of bonds outstanding, amounting to $209,853,000, includes $18,427,000 bonds purchased from time to time and now held in sinking funds. Cash on hand totaled $8,734,000 at the end of 1912, comparing with $10,653,000 on hand at the beginning of the year. Total working liabilities amounted to $12,261,000 at the end of 1912, as against $10,625,000 at the beginning of the year.

The table shows principal figures for 1912 and 1911:

	1912.	1911.
Average mileage operated	9,074	9,072
Freight revenue	$57,740,419	$58,033,243
Passenger revenue	21,083,419	22,552,567
Total operating revenue	86,723,068	88,272,208
Maint. of way and structures	13,541,030	12,406,279
Maint. of equipment	14,294,033	14,761,138
Traffic expenses	1,528,115	1,581,805
Transportation expenses	29,020,384	28,543,205
General expenses	2,263,387	2,249,500
Total operating expenses	60,646,949	59,541,926
Taxes	3,303,058	3,049,124
Operating income	22,650,360	25,574,069
Gross corporate income	24,801,404	27,748,768
Net corporate income	14,106,754	16,843,763
Appropriations for betterments	3,944,316	4,826,755
Dividends	8,867,128	8,867,128
Surplus	1,295,410	3,149,880

NEW BOOKS.

The Railway Library. Compiled and edited by Slason Thompson, Director of the Bureau of Railway News and Statistics. 466 pages, 5¾ in. x 8¾ in. Cloth. Price, 50 cents.

The issue of the Railway Library for 1911 is the third of a series begun by Mr. Thompson, and follows the general scheme of its predecessors in collecting into one volume selections from noteworthy papers and addresses of the year relating to railway subjects. In addition, the work also includes extracts from the experiences of Charles Butler, financier and philanthropist, in making a journey from the east to Chicago in 1833, and for a contrast a brief review of British railways by S. M. Phillip, reprinted from the *Railway and Travel Monthly* of July, 1831. Following these retrospects it has been deemed timely to reprint the first report of the Interstate Commerce Commission, written by Judge Thomas M. Cooley, its first chairman. As examples of the present views of regulating authorities recent utterances of Chairman Prouty and Commissioner Lane of the present Interstate Commerce Commission, and Judge Martin A. Knapp of the Commerce Court, are presented. The report of the Hadley Securities Commission appointed by President Taft is also included as one of the most important railway papers of the year.

Among other papers may be mentioned the report of Professor George F. Swain on the physical valuation of the New York, New Haven & Hartford, the discussion of "Prospective State Ownership in England and the United States," by W. M. Acworth, together with a discussion of "Railways and Nationalization in the United States," by W. F. Allen, and addresses by Fairfax Harrison, President of the Chicago, Indianapolis & Louisville; Julius Kruttschnitt, director of maintenance and operation, Harriman Lines; Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers; F. O. Melcher, late second vice-president of the Chicago, Rock Island & Pacific; Howard Elliott, president of the Northern Pacific, and L. E. Johnson, president of the Norfolk & Western.

The book also includes statistics of American railways compiled by Mr. Thompson for the year ending June 30, 1911, compared with statistics of foreign railways.

Letters to the Editor.

THE FLAGGING RULE.

Galeton, Pa., September 27, 1912.

To the Editor of the Railway Age Gazette:

Referring to Mr. Forman's article—"Carrying out the flagging rule"—in the *Railway Age Gazette* of August 16, I do not agree with Mr. Forman that the red lantern only should be used in giving a stop signal. Both the red and the white lantern should be held together in the same hand, for the reason that the white lantern can be seen by an engineman much farther than red ones of the kind furnished to flagmen on most railways. It would be interesting to know how many purchasing agents specify the shade of red when purchasing globes. In this connection, I think the red flag should be waved over the head instead of in front of the flagman.

I do not agree with Mr. Forman that employees should be threatened with discipline, such as dismissal or thirty days' suspension. It has been my experience that parents who continually threaten their children are not good disciplinarians.

I agree with Mr. Forman that standard code rule No. 99 is all that is necessary. Old rule No. 99 specified the distance a flagman should go out. I too have wrestled with the problem of train rules and discipline for a quarter of a century, and in all those years I have never heard of but one instance where a flagman complied strictly with old Rule No. 99. In that instance, where a train had stopped after having passed around a curve, the flagman went back to protect the rear. After he had been gone some time, the conductor saw him returning and called out inquiring as to why he did not continue to go out; the flagman replied that he had lost his count and had decided to start out again!

The flagmen on all roads, I dare say, flagged under the old standard rule, which specified the distance they should go out, just as they flag today under the present rule which does not specify the distance. This is why the present standard code rule No. 99 was adopted by the road I was identified with and afterwards by the American Railway Association. J. S. M.

TERMINAL WAREHOUSES.

New York, October 25, 1912.

To the Editor of the Railway Age Gazette:

In your editorial (issue of October 28), regarding terminal charges of railroads, you incidentally suggest the construction of warehouses by each road in the New Jersey meadows.

In this connection may I suggest a much larger and more important project that has long been in my mind, but which I have not had time to properly consider or to develop in detail.

The necessity of carrying large stocks of merchandise by wholesale and by many large retail dealers, and of moving this merchandise over the streets to and from places of business is recognized as one of the prime causes of congestion in New York, both of the streets and of the business houses. My idea is to create and maintain a great storage or warehouse depot somewhere on the Jersey meadows where all surplus stock could be stored, properly cared for, and handled as wanted. It would be located where all the railroads could reach it and provide necessary track facilities, and where docks could be constructed so that ships could discharge and load directly from the warehouses. The project would require almost a city of fireproof warehouses so located that they would have railroad tracks on one side and docks on the other, with all modern facilities for the rapid and economical handling and transfer of merchandise. Storage space in the warehouses, with track and dock facilities, would be rented at cost and a fair profit, to all applicants.

The project could be carried out either through public or private ownership.

Some of the advantages of such a project may be briefly suggested.

All surplus stock and merchandise could thus be delivered to, stored, and reshipped from these warehouses at a small fraction of the cost of the present lighterage, trucking and housing in the city, where rents are necessarily very high. Wholesale dealers would need to keep at their city stores only a full line of *samples* from which sales would be made, and orders would be filled and shipped directly from the storage warehouse by representatives of the firm, who would be in charge there. Retail dealers could keep there all surplus stocks, to be drawn upon as wanted.

The project if generally utilized would relieve the streets of New York of a very large part of the congestion that now prevails, due mainly to the enormous amount of trucking required to handle stocks to and from the city stores and warehouses.

Such a project should result in enormous economy to the business men of New York. While the aggregate initial cost of construction would of course be very large, it would be but a fraction of that of equal storage capacity in the city, and space could be rented at very reasonable rates. The cost of delivering, storing and reshipping stocks from these warehouses would be very small as compared with the present great cost of double lighterage and trucking, and storage in costly New York buildings. Rates of insurance would be materially less in the isolated, fireproof warehouses.

With the facilities on the spot for shipping by any rail route or by water merchants could guarantee shipments and deliveries in a much shorter time than under present conditions.

This is a very brief, hasty, and inadequate outline of a big project, which it seems to me is worth careful consideration.

S. Whinery.

TENDER DERAILMENTS.

Los Angeles, Cal., October 5, 1912.

To the Editor of the Railway Age Gazette:

Your editorial and the letter of E. W. Summers on derailments of locomotive tenders, in the issue of September 29, have recalled to my mind an experience of some twenty years ago, which in a measure confirms the deductions of Mr. Summers. While no serious accidents resulted the frequent derailments were annoying.

The incidents of which I write happened immediately following the substitution of heavier power for the light (16 in. cylinders) locomotives previously used on certain California branch lines. For a time, tender derailments were of almost daily occurrence, and always at the entrance to a certain sharp curve and going up a grade where the speed never exceeded twenty miles an hour. The engines were in mixed service, one trip each way a day being with a freight train, on which trip nearly all the derailments occurred.

The older tenders were carried by trucks of a type now obsolete, and which by means of semi-elliptic springs gave the frame a three-point support. The rear truck had one spring on each side spanning the boxes, and the front truck had two springs arranged parallel to the bolster. The tenders substituted were carried on swing beam trucks (Thielson) with side bearings having ⅛ in. clearance all around.

The chief engineer of the road did not allow the gradual elevation of the outer rail on approaches to curves, with the result that, while the curves were properly elevated for the speeds then in vogue, the elevation was very abrupt.

In course of the investigation which followed, one of the locomotives was stopped with a train at the curve, and while starting at a speed of two or three miles an hour, the tender left the track, having been derailed to the inside of the curve.

This, at first, appeared mysterious, but a little consideration revealed the fact that owing to the track condition and the action of the side bearings, the weight of the tender became concentrated on the outside rail under the front truck and the inside rail under the rear truck. In fact, this was so pronounced that one man with a three-foot bar rocked the tender until the inside wheels of the front truck left the rail. It was plain to be seen that the pull of the engine caused the flanges of the inside front wheels to pass over the rail and that this was due to the side bearing action. The side bearings of the front truck were removed, after which there were no more derailments.

It is probable, that there is no unit of rolling equipment that is so unyielding as a locomotive tender. It will not twist longitudinally, for the reason that the water tank is securely anchored to the frame, forming a practically rigid structure.

It is wrong to support such a structure on four points, expecting compression and extension of the springs to compensate unevenness of the track, as the time available for such spring action is not sufficient at high speeds.

Locomotive tenders equipped with side bearings, having small clearances on both trucks, are liable to be derailed when they pass over track with a low place in one rail, even on tangents, as the surge of the water in the tank at high speeds will probably cause the flanges of the rear truck to ride the rail at the low place.

With coaches the case is entirely different, as the structure is more flexible and can twist if the side bearings have insufficient clearances.

CHAS. F. PRESCOTT.

WHY AMERICANS SEE EUROPE FIRST.

NEW YORK, N. Y., October 26, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

"Kentuckian's" letter, published in the *Railway Age Gazette* of October 18, page 723, suggests some interesting points of comment as to the interest and value of American as against European travel. "Kentuckian's" remarks are certainly most appropriate.

I think a point might be made of the fact that American hotels are largely run for the benefit of the servants rather than for the guests. As you undoubtedly know, outside of the largest cities the American plan prevails. This means that the dining room is closed at a certain hour and any one detained by the exigencies of travel, who requests service after that time, is looked upon as more or less of a malefactor. And the hour for closing, be it noted, is sometimes as early as 8 P. M., this being done that the help may have time off, regardless of the requirements of guests.

Then, again, there is much similarity between one part of America and another, unless one ranges off to extreme points. New England places are largely imitators of Boston, in one sense or another; New York furnishes the model for the Middle Atlantic states, while the Chicago keynote dominates the Middle West. It is only when one penetrates to New Orleans or San Francisco that the differences which add zest to foreign travel become apparent. On the other hand, one taking a steamer across the Atlantic finds something new and different, and therefore interesting, as soon as the ship touches at Queenstown, Plymouth or Southampton.

Again, we must consider the tendency on the part of those concerned in the European tourist travel to cater to the wishes of the visitors; to flatter and cajole them, if you please. The man who travels abroad may realize that the hotel man who bows before him is an arrant humbug and would have little hesitation in cutting the visitor's throat to advance the inn-keeper's interests, if it could be safely done, but yet there is such a suavity and plausibility in his demeanor that even if he is charging more than he would charge a fellow-countryman, the American is so used to being overcharged at home, without any accompaniment of plausibility and flattery, that he does not mind the process as applied abroad.

The foreign contingent catering to tourist travel does not seek to impress upon the visitors the fact that one man is as good as another, after the American idea, which puts the hotel clerk and the bartender upon an elevation from which they sneer at patrons. Rather do they follow the Shakespearean advice and "crook the pregnant hinges of the knee, that thrift may follow fawning."

All these and other details might be mentioned as reasons why European travel is more interesting and pleasant, as well as more economical, than American travel for the persons who desire a change and relaxation, and the writer, at least, thinks that the "See America First Association" will have a job akin to gnawing a file in seeking to change the course of events.

Of course, there will always be a huge amount of American travel. The drummers alone furnish a good part of the railroad traffic of the day, and it has often seemed to the writer that poor people going around looking for work furnish another large contingent of passenger traffic. But surely American pleasure travel and resort business has not grown in proportion to the growth of the country. Saratoga is dead, Long Branch is dead, and the only resort that has developed largely is Atlantic City. One has only to examine the schedules of train service to Asbury Park, the Catskill Mountains and other nearby resorts to see that there has not been much increase in travel in the last 10, 15 or even 20 years.

F. W. SAWARD,
General Manager, *The Coal Trade Journal.*

PHILADELPHIA, October 21, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I was much interested in the letter printed in your issue of October 18, from "A Kentuckian," which you headed—"Why Many Americans See Europe First and Often." I can heartily endorse every point contained therein, and might enlarge on them, and add more. Something much more fundamental than advertising will have to be done in this country to make the slogan "See America First" effective.

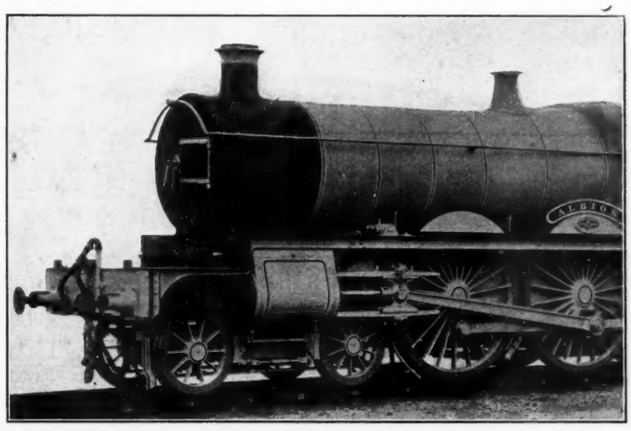
HENRY PAUL BUSCH.

SAFEGUARDING THE LOCOMOTIVE.

YEADON, Pa., October 31, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Considerable criticism has often been made by Americans of the "life guards" or "life irons" used on British locomotives instead of "cow-catchers." Even with the enclosed lines of English railways assuring an absence of many things with



Showing the "Life Guards" Which Are Used on English Locomotives in Place of Pilots.

which American railway enginemen have to contend, instances do occur in which cattle break through hedges and stone walls and wander at will upon the line until caught by an approaching train, sometimes with the result of partially reversing the well-known expression of George Stephenson, and making it

"bad" for the train as well as for the "coo." To many Americans who, like most people remote from prevailing conditions, are quick to criticize, it would seem that such accidents, infrequent though they may be in Great Britain, would suggest the use of the American "cow-catcher" as an additional safeguard; in fact about 1882 while the Eames Vacuum Brake Company was running its American built (Baldwin) locomotive on a night express train on a British line, it struck some obstructions placed designedly on the line by unknown persons, and I recall reading the report of the government officials who investigated the accident, in which they stated that the escape of the train from serious injury was owing to the fact that the engine was equipped with the American cow-catcher which swept most of the obstructions from the line.

Now this testimony to the efficiency of the cow-catcher is very flattering, but recently some miscreants piled stones on the track of the railway which passes my home, and even if the cow-catcher swept some of the obstructions away, enough remained on the rails to derail the engine, fortunately with nothing resulting more serious than its retirement to the shop for three or four days. This is but one of many such accidents which have come under my notice in the past, and too often of a more serious character, and it has occurred to me that it might be good practice to add the life guard of our English cousins to our locomotives, attaching it either directly in front of the forward truck wheels to the main frame, or to the frame of the truck itself, as is done on some English engines with "double bogie" trucks. Approaching so closely to the rail, it would certainly clear away many obstructions that would necessarily lie below the bottom of the higher cow-catcher.

It could also be attached to the rear end of tenders or to the tender truck frames, and in such a way to either engine or tender as would not seriously, if at all, interfere with repairs, while its very shape and position would undoubtedly enable it to force many obstructions from the rail more effectually than can be done by the cow-catcher with its lower sections placed diagonally to the lines of rails. C. H. CARUTHERS.

THE SUPERINTENDENT'S RESPONSIBILITY.

BOSTON, October 21, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The letter of W. G. Lee, in your last issue, page 722, discussing discipline and other things connected with train work, is highly suggestive. While the head of a brotherhood is looked upon by railway officers as a partisan, it must be admitted that in this letter Mr. Lee sets forth in telling fashion a good many significant truths. I am particularly interested in his reference to seniority. He says that men who cannot pass examinations are not promoted; if a man does pass—and the officers are the judge of his fitness—he is entitled to promotion.

This is a definite challenge to the railroad superintendent who complains at the seniority rule and bemoans its bad results on his own road. The superintendent does, indeed, bear the responsibility of judging of a man's fitness when he is up for promotion. A superintendent who acts on any other basis than his own best judgment is derelict.

To act on this high standard is difficult, of course. The usual complaint, when it is followed down to its simplest terms, is that no superintendent's judgment can be sufficiently accurate and penetrating. A man passes an examination, but later it is found that he is not so good as the examination seemed to indicate. But the man is then settled in his new position and it will require a fight to get him out of it. Is there not a remedy for this? I think so. The superintendent must judge more minutely; he must go fully into detail; the good and bad qualities of our enginemen, for example, must be described at length. Going into detail the officer will be forced to be just. Being just when making records on paper will tend to strengthen his spirit of justice when he is dealing face to face with a committee. Moreover, the superintendent must revise judgments when necessary. Suppose that fireman B is promoted, and after a year it appears that he is not quite up to the requirements of his position. It is a plain duty to the public—if the high speeds are to be expected and if the highest standards of engine running are to be maintained—to put fireman C in the place of B. Is it out of the question to take this course? Having chosen half a dozen enginemen who are rated as 80, 70 and 65 per cent., and finding that they really measure only 70, 68, and 64, is there no way to cure the error until one of the men kills a passenger or commits some other error which merits discharge? Knowing that these enginemen ought to measure up to a percentage of 85 or 90, the superintendent has no right to rest until he has done everything within his power to bring all of his men up to this standard. Can any committee of employees successfully find fault with or complain of the superintendent who gives this close attention to the discipline of enginemen and who makes his acts so plain and clearly understood that no one can gainsay his fairness and intelligence?

I am a friend of the superintendents; and you may even say, perhaps, that I am a partisan of that class. It irks me to see a smart labor leader vanquish a superintendent because he—the labor leader—has greater skill, experience and resources. But I want to say that the rank and file of the brakemen and firemen do really believe that they have a substantial grievance in the conduct of the railroad officers whose decisions they have occasion to study and to act on. Their grievance is based largely on the persistent way in which, after raising rates of pay, these officers try to neutralize the increase by grotesque and absurd interpretations of the rules. A superintendent may go too far in this course. Two wrongs do not make one right. If you have agreed to pay too much, do your best to get better service. Putting kinks into the regulations about hostler service, or adding puzzling conditions to the hours of service regulations, could hardly be expected to do much to correct a fundamental wrong, such as too high a rate of wages. "Beating the labor leader at his own game," is no lasting credit.

We have here a specific demand, voiced by a labor leader, that the American railroad superintendent live up to his duty to judge of the fitness of his employees; which implies the duty of acting on such judgment, filling all places with the best men that can be had, and getting rid (or reducing to lower rank) all men who are unfit. Does the existence of a troublesome grievance committee afford any excuse for neglecting this duty to the public? Or a tender feeling for an unfortunate blunderer, or for the officer of the road who is the blunderer's brother-in-law? Train service demands 100 per cent. men, for a single disastrous collision in twenty years reduces the percentage of safety below 100 to an extent that nobody wants to put up with. Admitting that perfection is not to be attained we still are bound to strive in that direction more vigorously than we have yet striven.

L. E. M.

MANCHURIAN RAILWAY CONSTRUCTION.—The line from Changchun to Kirin, in central southern Manchuria, has almost been completed and will probably be opened to traffic by December 1. This line will open up a very fertile district. It will be 79 miles long, 48 miles of which are already opened to traffic. At first traffic over the Tumenling pass will be carried on by a light railway which, however, will eventually be replaced by a tunnel.

TRANS-SAHARA RAILWAY.—According to French newspapers the parties sent out by the French government to explore the Sahara desert, Africa, with the idea of ascertaining whether or not it would be possible to build a railway across the desert, have now completed their work. The report is said to be most satisfactory, and it is believed now that all the obstacles can be overcome. If the government should decide to go on with the matter the entire plans may be completed by the end of the present year.

LAKE SUPERIOR & ISHPEMING ORE LOADING DOCK.*

A Structure of Steel and Concrete Combined Built at Marquette, Michigan, to Handle the Iron Ore Traffic.

By J. F. Jackson,
Vice President, Wisconsin Bridge and Iron Co., Milwaukee, Wis.

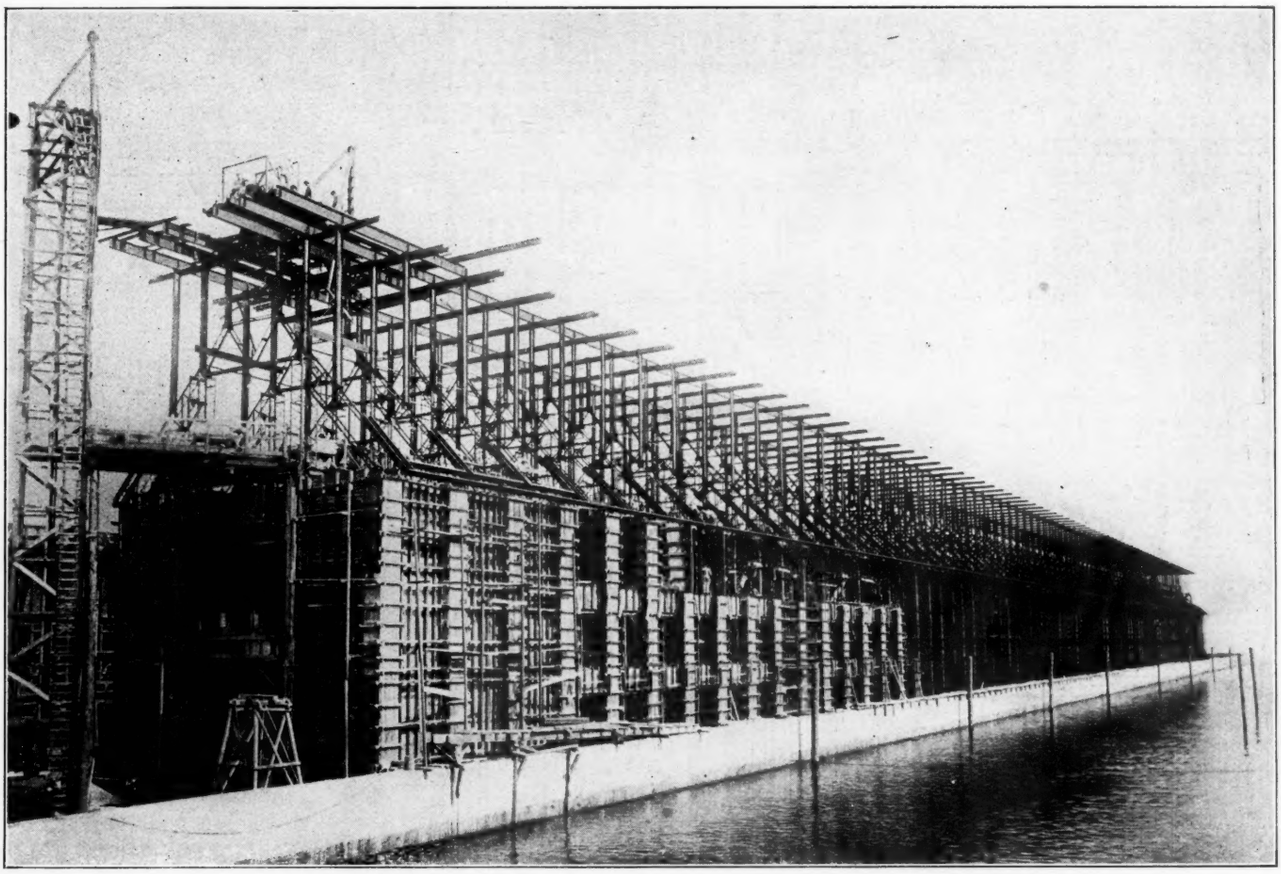
The Lake Superior & Ishpeming is primarily an ore-carrying road, shipping ore from its own, as well as from several independent properties, through the ore docks at Presque Isle Bay, Marquette, Mich. A wooden dock of ordinary construction has been in service there for about 16 years. In 1910 it became necessary to consider the erection of a new dock. The increase in cost and scarcity of suitable timber and the high cost of maintenance and operation of the wooden dock led to an investigation of the relative costs of different forms of construction. Estimates showed that a concrete and steel dock would cost about 167 per cent., and an all-steel dock 185 per cent. of the cost of a timber dock, but excluding the cost of operation, and including the cost of maintenance over a term of years, the total cost on a long term basis was found to be very much less for the concrete and steel design than for either of the others.

The concrete and steel dock plan, as finally adopted, was presented by the writer representing the Wisconsin Bridge & Iron Co. This concrete construction was quite similar to that previously used by the writer for the design of supports for large ore bins at the stamp mill of the Ahmeek Mining Co., in Houghton county, Mich.

*See descriptions of the Duluth & Iron Range dock at Two Harbors, Minn., in the *Railway Age Gazette* of January 5, 1912, the Great Northern dock at Allonez, Wis., in the *Railway Age Gazette* of January 26, 1912, and an editorial discussion of these docks in the latter issue.

Late in 1910 plans were prepared and the contract for the structural steel and machinery were let on a percentage basis. A fee for engineering services was a separate consideration. Concrete work and pile driving was let and arrangements made for dredging. The railway company furnished certain materials and did some parts of the work. One item was the construction of an approach fill containing 600,000 cu. yds.

The general dimensions of the structure are as follows: The dock proper is 1,200 ft. long, 75 ft. above water, 60 ft. wide at the bottom and 54 ft. wide at the top. There are 200 ore pockets, each of 250 to 300 tons capacity. Four railway tracks extend the whole length of the dock. There is an approach fill one mile in length on a 1.5 per cent. grade, a trestle 600 ft. long and a tail trestle 60 ft. long.



Erection of Steel and Concrete Ore Dock at Marquette, Mich.

The structure is supported on about 10,000 piles which are enclosed between two lines of 12-in. sheet piling. These lines of sheet piling were tied together across the top, from wale to wale, with 1¼ in. tie rods and the space between is filled with dredged sand. These tie rods were embedded in the bottom of the concrete slab. The sheet piling was of 12 in. x 12 in. Oregon fir with 4 in. x 4 in. hardwood strips nailed on two sides to form a dove-tailed tongue and groove. After the sand filling was in place the concrete slab, dock walls and column footings were placed. The 3 ft. slab was reinforced laterally and longitudinally by old wire hoisting rope in long lengths. This rope

was obtained from mines in the neighborhood at scrap prices and was from 1 in. to 1½ in. in diameter. A feature of the dock wall construction was the use of a steel facing plate extending from the bottom of the concrete to a height of three feet above low water. This plate is supposed to prevent the disintegration of concrete from freezing and abrasion of ice, government breakwaters in the neighborhood built only a few years ago showing the need of some protection of this sort.

The total length of slab is over 1,500 ft. and it was built without expansion joints. The whole foundation is extremely rigid and it is so massive that it is capable of withstanding very heavy "bumps" from large vessels.

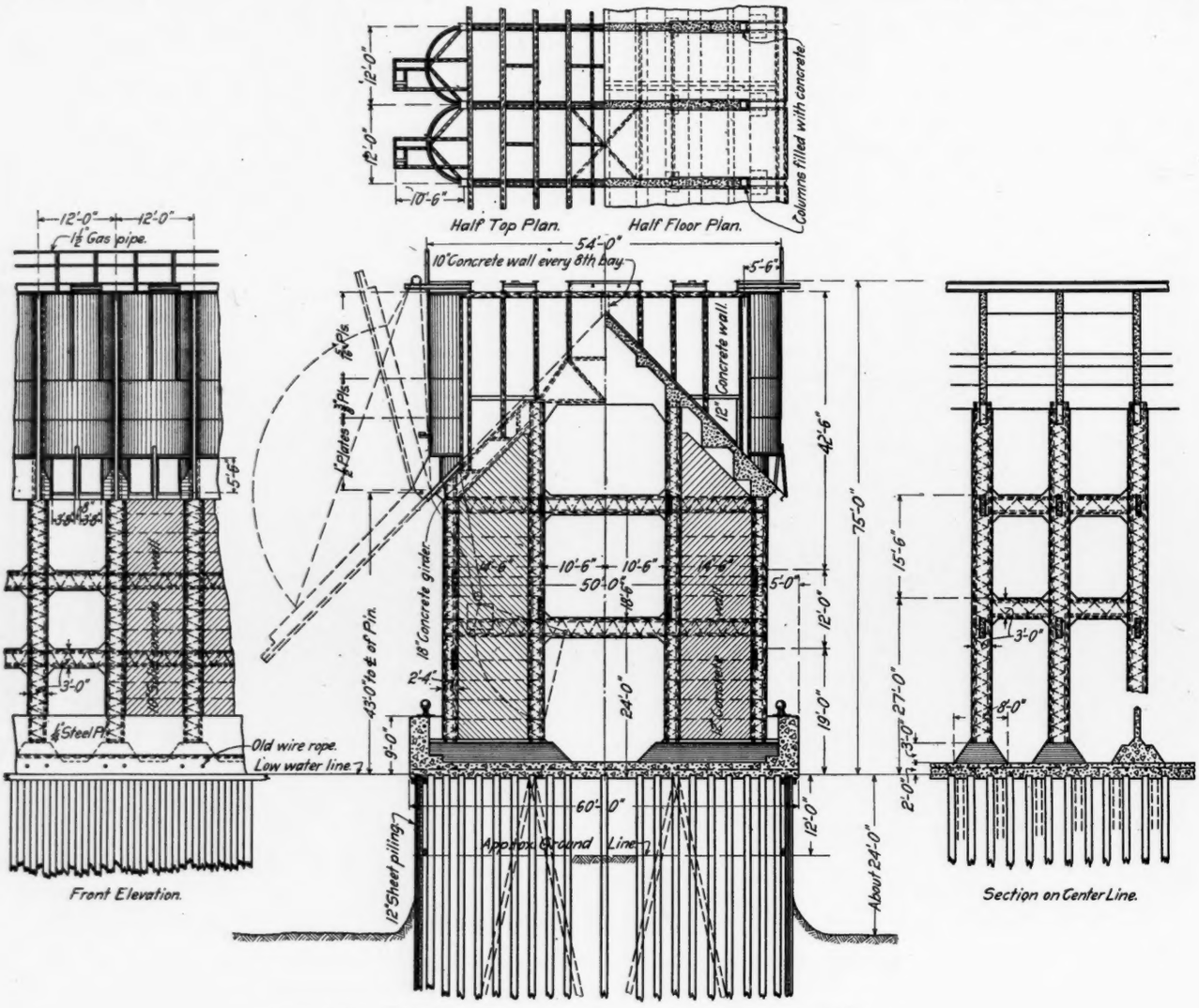
The work of placing the foundation slab was followed by the erection of the reinforcement for the columns, struts and bin partitions to the full height of the structure. The semi-circular bin fronts and some other parts of the steel work were not erected at this time.

The main columns of each bent are each 28 in. by 36 in. in size and are connected in pairs by 12 in. vertical walls. They are each reinforced by four 2½ in. x 2½ in. x ¼ in. angles, box laced. The columns and walls, which also carry load, were really figured as plain concrete carrying between 400 and 500 lbs. per sq. in. The slight reinforcement shown was put in to prevent cracking and to form a positive means of tying the whole structure together both laterally and longitudinally.

Forms were placed and the concrete poured in lifts of approximately 12 ft. The handling of the concrete and the design of the forms for use over and over again were large engineering problems in themselves. In a re-design of the structure the concrete part of it would probably be modified in some respects to simplify the work.

As stated before, no expansion joints were provided in the 1,200 ft. of dock but expansion joints were placed at each end where it joins the steel trestles. During the last winter and summer no cracks of consequence have developed, although the dock was placed in service several months ago. It is so massive and rigid that practically no vibration from trains can be felt even when brakes are suddenly applied.

The designs of the chutes and operating machinery were worked out specially for this dock and differ materially from those previously in general use. It is believed that this is the first instance in which the chute winding cable, drums, counterweight cable and swinging counterweight are laid out in such a way that the chute, which weighs 8,200 lbs., is perfectly balanced in every position. Each set of six adjacent chutes on a side is operated from a 2 in. line shaft driven by a 15 h. p. motor. Each hoist is operated from this line shaft by a friction clutch. Two or more hoists on one line shaft may be operated together, the time required to raise or lower a chute being only 20 seconds. To move the chute the operator must first release and hold the automatic brake with the left hand; then hold the lever of the friction clutch in operating position with the right hand.

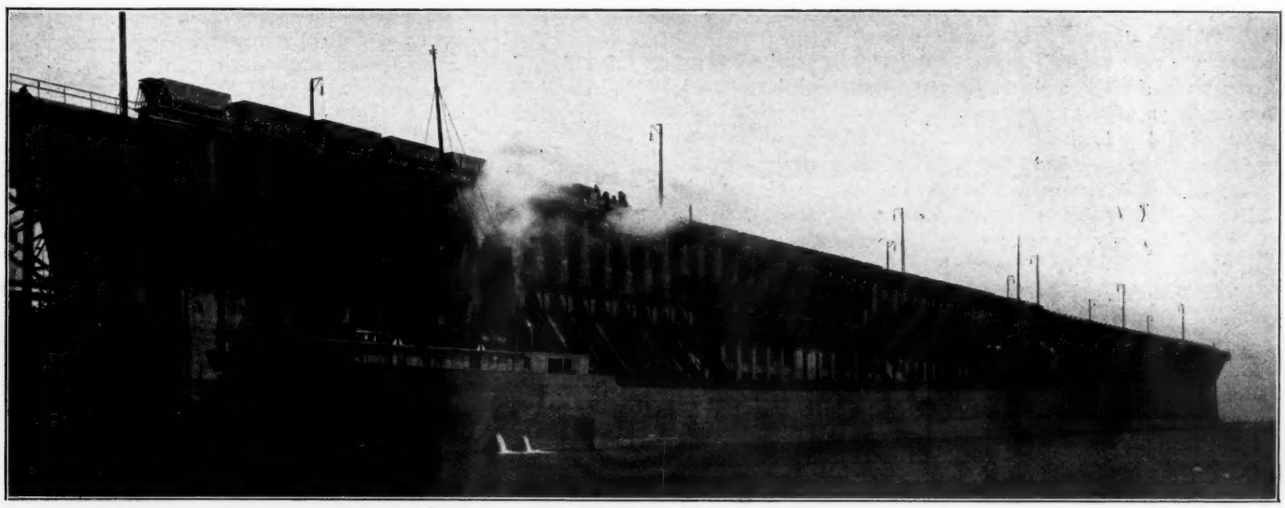


Details of Steel and Concrete Ore Dock at Marquette, Mich.

The machinery is simple and reasonably fool proof. All moving parts are well protected by safety coverings.

Each pocket has two doors, each 3 ft. 8 in. by 5 ft., emptying into the chute. The chute itself is 35 ft. long tapering from 8 ft. 6 in. at the upper end to 4 ft. 6 in. at the lower end, with a curved bottom throughout the whole length. Many ore chutes have been built with flat bottoms, straight sides or with bends in the sides which caused the ore to stick or to slop over. This chute was designed on the theory that soft iron ores flowing with some velocity would act much the same as a stream of water. The behavior of the chute in service seems to confirm this view. When both pocket doors are open the ore flows in the chute about a foot in depth, apparently faster in the center and with increasing velocity towards the end of the chute and the ores do not stick or slop over. The practical effect of this easy flow through the chute is to enable the operator to run one to the far side of vessels, 60 ft. or more in width, and to trim the load perfectly. Many of the old docks require an army of men for their operation because ore does not flow freely from the pockets but must be poked and "poled" out. Owing to the absence of sharp angles in the pockets and the location and width of the doors there is little of this work to be done in the new dock.

While accurate separate costs are not yet obtainable, the chief engineer reports that the operation costs are probably only one-quarter to one-third of those for the old dock. Maintenance and depreciation costs will not be large. Only a small amount of steel will require painting.



Boat Loading at Lake Superior & Ishpeming Ore Dock.

The writer and the engineers of the Wisconsin Bridge & Iron Company were chiefly responsible for the super-structure and R. C. Young, chief engineer of the Lake Superior & Ishpeming for the sub-structure. J. E. Greiner was consulting engineer. Steel and machinery were made and erected by the Wisconsin Bridge & Iron Company. Pile driving and concrete work was handled by the Raymond Concrete Pile Company, and the Zenith Dredge Company had the contract for dredging. A large part of the material was moved with a hydraulic dredge, the material being deposited to form the base of the approach embankment and to fill some swampy ground. The chutes were built under Carter patents, and a number of claims have been allowed on certain features of the super-structure. The whole work was carried out under the general direction of H. R. Harris, general manager of the Lake Superior & Ishpeming.

COLOMBIAN RAILWAY.—During 1911 the railways of Colombia transported 1,350,548 passengers and 383,930 tons of freight, for which they received a gross revenue of $2,758,281. At the end of 1911 there were 621 miles of railway in operation in Colombia.

MECHANICAL HANDLING OF BAGGAGE AND FREIGHT.*

Four-wheel electric trucks, similar to those used on the baggage platforms of a number of large passenger stations, have been in use at freight pier No. 6 of the Erie Railroad at Jersey City for about a year past in moving freight, and comparisons show a large saving in labor as compared with the movement of freight by the ordinary two-wheel trucks. In the month of August, 1911, the total force employed at this pier, including laborers, checkers, callers, foremen, clerks, motormen, sealers and coopers, was 77 men as against 126 in the same month of 1910. There was a reduction of about 10 per cent. in the volume of freight handled in 1911, notwithstanding which the cost per ton of handling was reduced 25 per cent. (from 38.4 cents a ton to 28.6 cents). The men added to the force in introducing the trucks were two electricians, one for day and one for night, and one helper. The number of common laborers was reduced from 100 to 37. The number of trucks used was 20. For the month of September the number of common laborers was 39 as against 112 formerly; complete force 79, reduced from 137; tonnage 7 per cent. less than in the former year, cost per ton 28 per cent. less. The record for October shows 38 common laborers, reduced from 115; total force 79, reduced from 140; reduction in tonnage 11 per cent.; reduction in cost per ton, 27 per cent.

Mr. Carr showed lantern pictures of different types of trucks. The standard freight truck has a loading space 42 in. wide, 7 ft. 1 in. long, and 20 in. above the floor, with end gates which can be turned down. With one gate turned down the platform is lengthened 3 ft. 1 in. One of the end gates may be lowered to the floor and thus used as a ramp on which to slide or roll heavy boxes or barrels from or to the floor. The floor of the truck is hinged in the middle, so that by lifting a portion the motor mechanism is all in sight and easily accessible. (Trucks for baggage are made with the main deck high enough to be near the level of a car door with a smaller deck beneath on which may be placed hand baggage.) The trucks can be run at speeds as high as 12 miles an hour, and on one occasion at the Grand Central Station in New York City a truck load of mail bags was started from the baggage room only one minute before the leaving time of the Twentieth Century Limited. The truck reached the baggage car just as the train was starting, and, by

*Abstract of proceedings of the New England Railroad Club at Boston, Mass., February 13: paper by William C. Carr, president of the Automatic Transportation Co., Buffalo, N. Y.; discussion by E. H. Watlington (Sprague Electric Co.), George W. Brown (Elwell-Parker Electric Co.), J. M. Barrett (Automatic Transportation Co.), and W. P. Coria (Merchants' & Miners' Transportation Co.)

keeping the truck moving alongside the car the bags were all put in before the car had got beyond the end of the platform. A run of 1,200 ft. with a load of 4,500 lbs. has been made in 16 minutes, including the time taken to return the empty truck. With one truck two men, handling newspaper mail, in one hour did work which usually had required the service of four men two hours.

Trucks carrying a load of one ton are run up grades of from 5 to 25 per cent. The trucks can be run on platforms 8 ft. wide, turned into a freight car door and run into either end of the car for loading or unloading. Where space is limited the large capacity of the trucks is an important advantage. Twenty trucks will carry 20 tons of freight; with ordinary two-wheel trucks this quantity usually requires a procession of 160 workmen.

Mr. Watlington presented some estimates which he had made relative to the economies possible in handling freight. He finds that the average income of the railways of the country for the freight which they carry is $1.07 a ton. From estimates based on 15,000,000 tons of L. C. L. freight, the statistics of which had come under his observation, he concluded that the average cost of handling, including the work at the starting point, at destination and at transfers, is 62 cents a ton; which would leave but 45 cents a ton for transportation over the road. Real estate in cities has increased in value so rapidly that the freight house problem is a difficult one. At one station in Chicago, the cost of handling outbound freight is 52 cents a ton, whereas 20 years ago it was only one-half as much, the average trucking distance being then shorter and the house less crowded. Over-head hauling is an attractive proposition, but to use this method you must rebuild your freight house. Mr. Watlington gave facts concerning the over-head hauling apparatus in a new freight house of the Baltimore & Ohio, at Baltimore, and that of the Missouri, Kansas & Texas, at St. Louis.

At St. Louis, the present average daily tonnage is 330 tons, far less than the capacity of the plant. The over-head apparatus there cost $90,000, but the real estate investment was several millions. It was this high cost of land that necessitated the expensive machinery. The apparatus worked successfully the very first day that the house was open. The cost per ton then was 70 cents. In spite of greatly reduced tonnage it has now been reduced to about one-half that. With tonnage near the capacity of the plant the cost will go below the prevailing rate in St. Louis, which is about 35 cents a ton where all the work is done on one level.

Mr. Brown gave statistics of the work of two trucks for a month on a New York pier. These trucks worked 26 days of 11 hours each and made an average mileage per day of 13.6; average tonnage per day, 225; per hour, 20.3. Total number of loads, 230; average length of haul, 158.5 ft.; average number of pieces per load, 29.8; average time per load—loading, unloading and running time—2.89 minutes. This work was done by a gang of eight men, two on the trucks, three in the car, and three on the boat from which the freight was taken. Mr. Brown thought that the work could have been done economically by six men. This gang of eight men in the average day handled and was paid for 247 tons; that is to say, an average of 22 tons a day had to be handled by the two-wheeled truck or by some other method. The men earned $2.40 a day, or at the rate of 8.7 cents a ton. Mr. Brown estimates that the maintenance of the trucks cost about four mills per ton of freight hauled.

Fifty-two baggage trucks at the Pennsylvania passenger station in New York, during the month of April, cost for maintenance 89 cents per truck. In this calculation the cost of electric power is estimated at 2½ cents per kilowatt hour. Some Buckwalter trucks are now being made with a 7 ft. platform and with rear wheels 9 in. in diameter, so arranged that the truck can go into the corner of a freight car. Within two or three months it is expected that 200 of these trucks will be in use on a large railway.

Mr. Barrett, who had used the electric trucks at Jersey City, made comparisons with telpherage, tending to show that that method would be more costly than electric trucks. He said that the results at the Erie pier, which had been referred to, were accomplished in spite of unfavorable conditions on the pier, which was built 48 years ago. He referred to the fact that the freight which had been handled at the Erie pier was miscellaneous merchandise distributed into a large number of cars, whereas the work described by Mr. Brown was a simpler proposition, the freight being taken from the boat direct to one car at a time. Freight thus handled from boats to cars, or cars to boats, costs, at Weehawken, N. J., by old methods, about 8 cents a ton.

Mr. Coria related his experience with 20 electric trucks at Savannah. To load the trucks to their full capacity it was found necessary to rearrange the stowage of cargoes in the holds of the vessels. At first there was congestion around the hatches of the ships, the trucks having to wait for the hoister to lift freight from the lower decks; but this was overcome by using a flat board about the size of the truck bodies, fitted with rings on each corner; with this board a load for a truck is lifted at one hoist. The flat board is returned on the empty truck for the next load. This arrangement is for small packages. In handling grain, flour, nails, etc., rope slings are used. Twenty bags of grain of 100 lbs. each are taken up at once in a double sling and set on the truck. An electric truck will carry as much long pipe as can be taken on eight hand trucks. An electric truck carrying 1,500 lbs. will travel at 138 ft. a minute; a hand truck carrying 400 lbs. in similar service averaged 156 ft. per minute. In trucking freight an average distance of 1,170 ft. the cost was found to be 9 cents a ton, while with hand trucks for this distance the cost was 17 cents a ton. At Savannah the average distance from the main discharging berth to all the warehouses is 637 ft., and variation in tides makes differences in the grades from 37 per cent. to zero. Seventy per cent. of the freight can be carried on electric trucks and for the balance it is necessary to employ hand trucks. The negro laborers are educated within a few days to run an electric truck.

Railroad Construction in Colombia.—The Pacific Railway, which is now under construction from the port of Buenaventura on the Pacific coast of Colombia, west to Cali, department of Cauca, about 60 miles, and has contracted with the Colombian government to extend the road northeast to Girardot, about 125 miles, where connection will be made with the Girardot Railway, which runs northwest to Bogota, about 50 miles. Bogota at present has no railroad connection with the coast. The contract also calls for the construction of branch lines from Cali south to Popayan, about 75 miles, and from Cali north to Manizales, about 110 miles. The construction work on the Popayan and Manizales branches is to be commenced immediately upon completion of the main line from Buenaventura to Cali, which should be some time next summer. The Manizales branch will pass through the towns of Pereira and Cartago. The Columbian government will apply 50 per cent. of the customs duties collected in the custom houses on the Pacific coast to this construction. The headquarters of the company are at Cali.

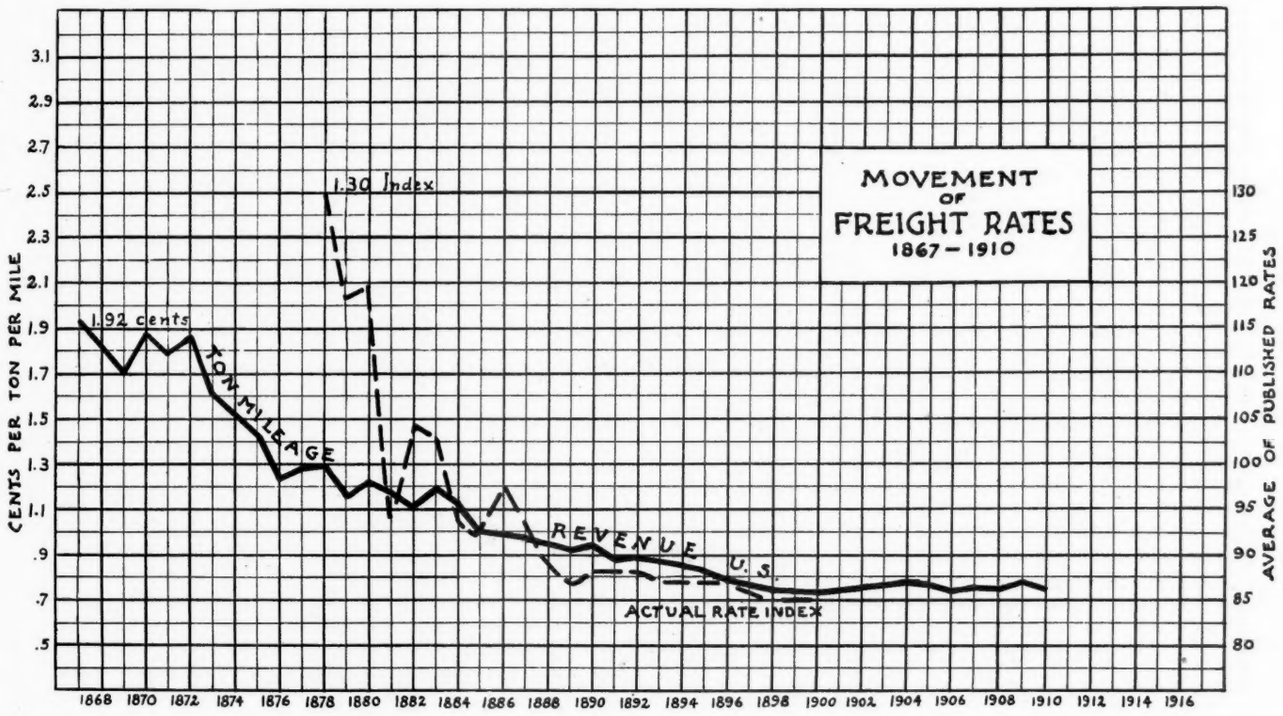
Railroad Construction in the Philippine Islands.—Construction work on the line from Aringay on the coast of the province of Union in the central western portion of Luzon island, east to Baguio in the province of Benguet, about 20 miles, is progressing rapidly, even better than the officials of the company thought possible at the beginning. Over nine hundred men are working at the Baguio end of the new road, from which more than four miles of grading work has been completed toward Aringay. At Aringay working toward Baguio is a camp of 1,200 men, which will be increased in the near future to 4,500 men. About two miles of track has been laid from Aringay, and the grade is completed for nearly seven miles further. Hydraulic streams are being used to cut down the dirt grade, the water being obtained from the Irosen river. The main tunnel in this line has already been driven 165 ft. into the cliff to its full height. The work is already more than half finished.

THE COURSE OF RAILWAY RATES SINCE 1870.

Changes in Receipts Per Ton Mile Do Not Accurately Determine the General Tendency of Rates in This Country.

By William Z. Ripley,
Professor of Economics, Harvard University.

The course of railway rates in the United States during the last generation divides naturally into two periods, before and after 1900 respectively.[1] Prior to that date an almost uninterrupted decline took place, which has been followed by a strongly marked upward tendency during the last decade. In respect of freight rates this movement is commonly judged in either of two ways: by comparison of actual rates charged for specified service between given points throughout a series of years; or, secondly, by means of what is called the revenue per ton mile. Considering first the use of this latter index, the course of events is shown by means of the diagram upon this page, covering the period between 1867 and 1910. But before



conclusions may safely be drawn from this showing, it is imperative that the true significance of revenue per ton mile statistics should be set forth. For a generation, and particularly in connection with the Roosevelt legislation in 1906, volumes of written and oral evidence upon moot questions were based upon such figures. Specious and misleading reasoning upon a public question was perhaps never so common in the course of our history.[2] It is most important to understand clearly the real significance of this common statistical unit. We shall then, only, be in position to interpret the diagram properly.

The revenue per ton mile for a given road, or for the railway system of the United States, is computed by dividing the total freight revenue for that service, whatever it may be, by the number representing the amount of freight in tons hauled one mile. Thus, for example, if the total freight revenue of a system of roads be $900,000,000, this having been received as compensation for hauling an equivalent of 90,000 million tons of freight one mile, the compensation actually received for each ton hauled one mile is obviously one cent. All that is necessary in order to compute the average revenue per ton-mile, then, is to know the total freight revenue and the amount of ton-mileage service. Computed in this way the average revenue per ton per mile for the railways of the United States in 1867 was 1.92 cents. From this level a decline took place of 0.941 cents in 1890—that is to say, the average amount received for each ton of freight hauled one mile had declined about one-half. Since that date, there has been no considerable change, the corresponding figure for 1911 being 0.757 cents. In other words, at the present time the carriers of the United States receive about three-fourths of a cent for each ton mile service. From a revenue point of view this unit may seem insignificant in amount, but it should be borne in mind, of course, that it is applied to an immense volume of traffic. Even the slight difference between 1900 and the present time, if applied to the volume of traffic now existing, would make a difference in freight revenue for the entire railway system of the United States of approximately $61,000,000.

Measurement of the course of freight rates by means of revenue per ton mile possesses one great advantage. It measures the actual return received by the railway without regard to the published tariff, showing accurately, therefore, the degree to which such departures from the published rates took place. For this reason, the foregoing diagram probably under-indicates the extent, relatively, of the decline before 1900. For it is indubitable that the published rates have been very much more nearly observed with the passage of time during this decade.[1]

[1] U. S. Industrial Commission, XIX, 1901, pp. 272-290; *Annals of the American Academy of Political Science*, 1898, pp. 324-352.

[2] Revenue per ton mile in index to the Senate (Elkins) Committee Hearings, 1905, vol. IV.

[1] Compare conclusions as to rebating in 1900; U. S. Industrial Commission, XIX, p. 285. When, as in 1887, a general departure of 50 per cent. from published rates characterized transcontinental traffic, the difference between the theoretical and actual revenue, as measured by the published rates, is very great. 21 I. C. C. Rep., 349.

On the other hand, revenue per ton mile, as thus used for general purposes, is open to a number of very serious objections. Obviously, like any statistical average, it fails to represent the actual payment for any given service. But its disadvantages are more deeply seated than this. Entirely irrespective of any change in the level of rates, revenue per ton mile is affected fundamentally by three distinct sets of conditions. It varies according to the nature of the traffic, whether high grade or low; it is affected by the length of the haul and the proportion of local as distinct from through business; and it is modified profoundly according to the volume of traffic handled.

Before proceeding to the consideration of the above mentioned factors, attention may be directed to the following table, which gives the extreme range of ton mile revenue for a number of different railways arranged in groups according to the nature of their business.

1910.	Revenue per ton mile. (*Cents*)	Freight density.	Av. haul per ton. (*Miles*)
New England—			
New York, New Haven & Hartford	1.417	1,057,000	93.4
Boston & Maine	1.08	1,046,000	102.8
Southern—			
Atlantic Coast Line	1.273	365,000	145
Southern R. R.	.957	.....	...
Louisville & Nashville	.751	1,124,000	170
Illinois Central	.589	1,445,000	238
Western and Transcontinental—			
Denver & Rio Grande	1.279	532,000	104
Southern Pacific	1.232	745,000	256
Union Pacific	1.011	1,091,000	364
Northern Pacific	.900	940,000	297
Great Northern	.822	814,700	244.1
Granger—			
Chicago & North Western	.891	729,000	141
Chicago, Milwaukee & St. Paul	.843	709,000	173
United States, all roads (1911)	.753	1,053,566	146
Trunk Lines—			
Erie	.626	2,808,000	146.3
New York Central & Hudson River	.625	2,548,000	195
Pennsylvania Railroad	.580	5,139,000	168
Baltimore & Ohio	.577	2,711,000	191
Lake Shore & Michigan Southern	.515	3,911,000	171
Coal and Ore—			
Philadelphia & Reading	.765	4,506,000	97
Lehigh Valley	.646	3,288,000	174
Hocking Valley	.458	4,014,000	125
Bessemer & Lake Erie	.453	8,051,000	118
Norfolk & Western	.447	3,456,000	264
Chesapeake & Ohio	.407	3,161,000	267

Furthermore, each group is graded within itself according to the revenue per ton mile. From this showing it appears that for 1910 the range above and below the average for the United States is considerable—being upwards of three times as great for the New Haven system as for the Chesapeake & Ohio, which comes at the foot of the list. It will now be in order to explain the reasons for these wide variations, which are by no means, as is customarily assumed in public discussion, conditioned even primarily by the level or reasonableness of the freight rates charged. Until these attendant circumstances are fully understood, any conclusions as to relative freight rates for a given service based upon revenue per ton mile are entirely misleading.

The nature of the traffic handled by a carrier is the most important consideration to be kept in mind in interpreting revenue per ton mile data. This is most clearly shown by comparison in the table between the group of coal and ore roads and the New England systems. The revenue per unit of service on a road whose traffic is largely of low grade must necessarily be low. Probably the lowest average ever reported in the United States was for the Chesapeake & Ohio in 1899—the low point in the general movement of freight rates—when its ton mile revenue touched 0.362 cents. Whenever the business of a carrier consists largely of coal, grain, lumber or other low grade commodities on which the freight charges must necessarily be exceedingly low in order that the freight shall move at all, the revenue per ton mile must consequently stand at a low figure. Bald comparison of any such revenue with a corresponding figure for high grade roads is obviously misleading and fallacious. It does not mean that the latter necessarily charges more for the same service; but its higher revenue per ton of freight moved one mile may be, and very likely is, merely due to the fact that much of its tonnage is capable of bearing higher charges. From this circumstance it also follows that comparisons from year to year, either for single roads or for the entire railway net, must be made in the light of variations in the proportion of high and low grade tonnage. The trend seems to have been steadily downward in this regard year by year. A steady increase relatively in the volume of low grade traffic has long been under way.[1]

The development of the last 20 years in the United States has certainly been in favor of a great increase in low grade traffic. This is shown by the following table, giving the per cent. of tonnage in various classes upon the trunk lines from New York to and beyond Chicago.

From this it appears that "60 per cent. of the tonnage is now (1893) carried in fourth, fifth and sixth classes. . . . Prior to 1886 no considerable number of articles were permanently assigned to the fifth and sixth classes; they embraced usually a few commodities which had been assigned a special rate." Further consideration of this table shows that first-class freight, forming 30 per cent. of the tonnage in 1878, declined to less than 20 per cent. in 1892, at the same time sixth-class freight increasing from nothing to 43.4 per cent. in 1892. Fourth-class freight declined during the same period from 57.9 to 10.4 per cent. These figures simply mean that a great deal of traffic is now carried upon American railways for long distances which a generation ago it was believed could not be profitably moved at all. The utility of the railway service, once supposedly confined entirely to freight of the higher classes, has been gradually extended until today there is no commodity too cheap to be handled with the improved facilities. This vast increase in the amount of low grade traffic is undoubtedly responsible to some degree for the apparent decline of freight rates so often instanced. Fortunately upon this point we have the specific testimony of traffic managers of long experience. On the other hand, in justice to the railways it must be admitted that the proportion of local business at high rates, which would tend to increase the average revenue per ton mile, has steadily increased with the growth of the country; and, moreover, as has already been shown, in times of exceptional prosperity the movement of high grade freight has increased in more than its due proportion.[2] Nor are these facts adduced in criticism of American railway policy. They are simply intended to draw attention to the fact that, while changes of freight rates have undoubtedly

[1] The movement of average trainloads in connection with ton mile revenue bears upon this point. Thus in 1905, the increased trainload, accompanied by a lower ton mile revenue, points specifically to an increase in low grade traffic.

[2] The effect of periods of depression, such as 1903 and 1908, upon the proportion of low grade tonnage is a moot point.

Per Cent. of Tonnage in Each Class of Freight on Trunk Lines, West Bound.*

Class.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.
1	30.4	31.3	26.4	25.1	23.1	29.5	25.6	24.8	23.3	18.9	19.3	22.2	21.0	19.4	19.9
2	6.9	7.2	6.7	6.4	6.2	8.0	7.6	7.1	7.9	7.5	7.2	6.9	6.4	5.7	5.4
3	4.8	5.0	4.4	5.1	4.2	4.9	4.1	4.2	5.2	8.1	10.4	12.8	12.3	11.4	11.3
4	57.9	48.7	50.1	53.7	58.9	42.8	32.9	29.3	20.9	14.1	13.5	13.0	12.7	11.1	10.4
5	0.0	6.5	10.6	9.7	7.6	14.8	29.8	34.6	42.7	16.1	9.2	7.8	10.0	9.1	9.6
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.....	35.3	40.4	37.3	37.6	43.3	43.4
Special	0.0	1.3	1.8	0.0	0.0	0.0	0.0	0.0	.....	.....	.....	.....	.....	.....	.....
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Senate Finance Committee Report on Prices, 1893, Part I, p. 437.

been considerable, they have not been as great as is oftentimes plausibly stated. As for comparisons with foreign countries, they are practically invalidated by the difference in local conditions, as, for instance, in England, where local delivery is included. In the United States such service is charged in addition, either as drayage or express.

The increased diversification in the freight tonnage of American railways, always in the direction of a larger proportion of traffic from general business rather than from the movement of staple commodities, is also of great fiscal significance. It means not only more business, but better and more permanent traffic. The difference moreover, between the charge which high grade freight, such as merchandise, will bear by comparison with the highest rate upon grain or coal, is much greater than any difference in the cost of service. The profit, therefore, attendant upon the movement of traffic other than low grade commodities is often great; although, of course, profitableness is a question of relativity between operating cost and revenue. Heavy train loads of coal at 4 mills per ton mile may be better business than merchandise in light carloads at rates five times as high. Nevertheless the tendency toward higher grade tonnage has been notable, especially since 1900. Many western roads, and even the trunk lines, formerly dependent in a great measure upon the movement of crops, are now affected only indirectly in this regard, by reason of their influence upon general business. The growing diversification of traffic because of its financial importance merits more concrete illustration.

The Lake Shore & Michigan Southern, during the calendar year 1900, increased its freight tonnage by 1,760,000 tons. Of this only 194,000 tons were specified as products of agriculture and animals, while products of the forests actually declined by 84,000 tons. In other words, nearly all of this phenomenal increase in business in 1900 was due to the movement of manufactures, minerals, and merchandise. A comparison made for the last three decades makes this point still more clear. Since 1880 there has been very little increase in agricultural tonnage upon this trunk line, with an actual decrease in the movement of grain. This, perhaps, may be in part explained by the great development of grain traffic upon the lakes, which, of course, absorbs much business formerly carried by this road. In other words, farm products and provisions transported by the Lake Shore rose from 3,465,000 tons in 1880 to only 3,843,000 tons in 1900. The movement of petroleum and lumber actually decreased, owing to the construction of pipe lines and the clearing of the forests. On the other hand, manufactures and merchandise increased threefold in volume, rising from 3,754,000 tons in 1880 to 14,932,000 tons in 1900. Whereas agricultural products in 1880 formed over 40 per cent. of the traffic upon the Lake Shore, they constituted in 1900 less than 20 per cent. Much the same tendency is manifested by other routes. Thus for the fiscal year 1901, the Chesapeake & Ohio reported substantial decreases in the actual tonnage of flour, grain, sand, stone, iron, etc.; but a largely augmented movement of general merchandise of the higher classes. Many of the soft-coal roads such as the Cleveland, Lorain & Wheeling, which used to carry nearly two-thirds of their tonnage in the form of coal, now carry less than 40 per cent. A feature of importance in the great prosperity of the anthracite coal roads has been a steady increase in the volume of their general traffic as distinct from coal tonnage. All over the country, in short, the steady growth of population and the decline in the proportion of grain for export is reducing, relatively, the importance of low grade tonnage, supplanting it by a movement of supplies and merchandise in the contrary direction.

The classification of tonnage for the United States, as a whole and by main divisions, is shown by the following excerpt from *Statistics of Railroads* for 1909:

Conclusions from these figures are well worth noting. The importance, measured by traffic rather than revenue, of low grade freight classed as products of mines, is notable. This forms more than half the aggregate tonnage for the United States, and has appreciably increased within the last ten years. In 1910, it constituted almost two-thirds of the business in trunk line territory and almost one-half in the West. Products of agriculture, on the other hand, even in western territory, amount to less than one-fifth of the total tonnage. These facts indicate clearly the diverse conditions under which railways operate in different parts of the country. The next table[1], besides incidentally throwing more light upon the relative tonnage of staple commodities, will suffice to establish our main point—namely, that the nature of the traffic vitally affects all ton mile revenue statistics. It entirely, in fact, overshadows mere changes in the general level of freight rates. Any argument concerning the movement of such charges, which fails to correct fully for this factor, may be dismissed at once as valueless.

FREIGHT TRAFFIC MOVEMENT.

Class of commodity.	United States. Tonnage. Tons.	United States. Per Cent.	Trunk Line Territory. Tonnage. Tons.	Trunk Line Territory. Per Cent.	Southern Territory. Tonnage. Tons.	Southern Territory. Per Cent.	Western Territory. Tonnage. Tons.	Western Territory. Per Cent.
Products of agriculture	73,683,720	8.92	19,009,546	4.65	9,569,169	7.92	45,105,005	15.18
Products of animals	20,593,352	2.49	7,610,582	1.86	1,002,340	.83	11,980,430	4.03
Products of mines	459,560,732	55.60	256,261,843	62.71	63,050,150	52.20	140,248,739	47.22
Products of forests	97,104,700	11.75	21,553,953	5.28	25,304,631	20.95	50,246,116	16.92
Manufactures	108,677,129	13.15	70,084,904	17.15	13,399,659	11.09	25,192,566	8.48
Merchandise	33,975,628	4.11	13,539,555	3.31	4,806,660	3.98	15,629,413	5.26
Miscellaneous	32,897,504	3,98	20,589,318	5.04	3,660,850	3.03	8,647,336	2.91
Grand total	826,492,765	100.	408,649,701	100.	120,793,459	100.	297,049,605	100.

SUMMARY OF SELECTED COMMODITIES FOR THE YEAR ENDING JUNE 30, 1910.*

Commodity.	Freight carried in carload lots. Tons.	Ton-mileage of freight carried in carload lots. Ton-miles.	Revenue from freight carried in carload lots.	Average receipts per ton per mile from freight carried in carload lots. Cents.
Grain	31,947,009	7,067,690,568	$44,553,330	0.630
Hay	5,856,185	954,623,830	9,731,590	1.019
Cotton	3,400,316	689,594,719	12,573,674	1.823
Live stock	10,754,108	2,449,310,036	29,802,514	1.217
Dressed meats	2,407,454	724,239,606	6,548,955	.904
Anthracite coal	28,202,577	5,104,428,347	30,083,630	.589
Bituminous coal	192,479,389	22,228,778,428	110,139,107	.495
Lumber	68,482,732	11,891,569,514	87,225,470	.734

*Mileage of roads represented on June 30, 1910—130,395.46 miles.

A second consideration of equal importance with the nature of the traffic, in the interpretation of ton mile data, is the length of the haul and the proportion of local as distinct from through business. This necessarily follows from the nature of a distance tariff. Only on condition that the rate augmented in direct proportion to the increase of distance, would the revenue per ton mile remain constant. The accompanying diagram is instructive in this connection. The charge—denoted by height of the curve at any given point—tends to grow much less rapidly than distance. In other words, the rate curve approaches a parabolic form, until after a certain point it becomes practically a flat rate, independent of distance. This fact of necessity causes ton mile revenue to decrease steadily with the length of the haul. For ton mile revenue is but the ratio of the abscissa to the ordinate of the curve at any given point; the former being the rate charged, the latter the distance. In practice, therefore, the longer the haul in general, the lower is the revenue per ton mile.[2] This is clearly shown by comparison of the two items for

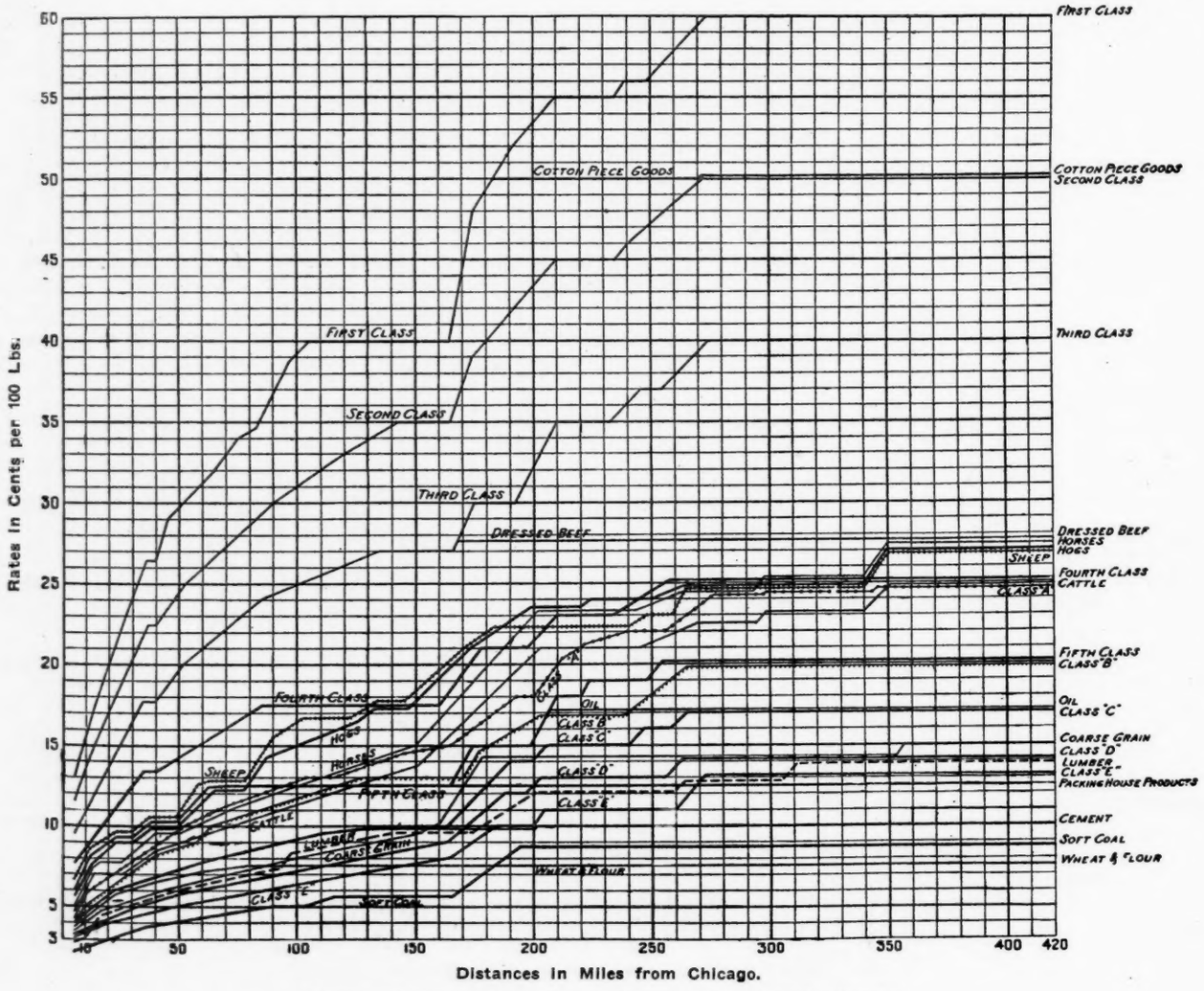
[1] *U. S. Statistics of Railways*, 1910, p. 64.
[2] Cf. Railway Problems, p. 509.

given roads, otherwise similarly circumstanced, in the table already discussed above.

Closely akin to the length of haul, in affecting ton mile revenue, is the proportion of local traffic. This also is in practice vital. Obviously it costs much more to handle local business, the terminal expenses being far greater in proportion. And at the same time a larger proportion of the freight moves in small lots locally. But there is yet another reason arising not from differences of cost but from what the traffic will bear. Local rates, measured by the height of the curve between competitive points, must ever be greatly above those applying at points where deep cuts must be made in the charge in order to hold business against rivalry. This difference between revenue per ton mile for local business and through traffic is very great. On the Louisville & Nashville, for example, in 1886, it was 1.48 cents for the former, as against .99 cents for through business.* The Illinois Central in 1900 reports an average revenue per ton mile on through freight of 0.48 cent, while for local freight the corresponding figure is 1.17 cents, the average of both being 0.56 cent. It is apparent from this that any accurate determination of the level of charges in general must take account of such facts as these.

Any carrier like the Southern Pacific, the Chesapeake & Ohio or the Erie with relatively little local traffic and a business dependent largely upon the long haul, will conduct transportation for a materially lower figure than roads in a densely settled territory. This consideration was recently illustrated in Massachusetts experience.* The Fitchburg Railroad, devoted to long distance, low grade business by the Hoosac tunnel route, was consolidated with the Boston & Maine in 1900. Its revenue per ton mile was formerly .818 cent based upon such traffic. When it was merged with the Boston & Maine,—considerably blessed as it is with local traffic,—the latter's ton mile revenue fell from 1.44 cents in 1900 to 1.158 cents in the following year. There had been no change whatever in freight rates.

A word may be interposed in this connection as to the peculiar movement of local as distinguished from through rates through a series of years. Local charges have decreased relatively little, probably because of the absence of competition in such cases. They have, moreover, decreased very unevenly in different parts of the country. Apparently one of the first and most beneficent results of the enactment of the Act to Regulate Commerce, in 1887, was a reduction of local rates in various parts of the country, in order to bring the rate adjustment into conformity with the long and short haul clause. This was peculiarly the case in the northeastern or trunk-line territory. It does not seem to have occurred in the southern states, where the long and short haul principle has never been accepted in its entirety. The most comprehensive report upon the subject concludes that local rates have in various parts of the country, during the last quarter century been reduced from 10 to 50 per



Class and Commodity Rates Between St. Paul and Chicago.

*Senate (Elkins) Committee, Digest, App. III, p. 63, brings out the high proportion of local business in the South. On the L. & N. 80 per cent. is thus classed.

*Mass. Commission on Commerce and Industry, 1908, p. 117.

cent.[1] Returns from various railway commissions interrogated by the Industrial Commission in 1900 upon the subject showed highly variable results. From Mississippi it appeared that "local freight rates in this state have been materially lowered in the last four years, especially in the lettered classes," while from the adjoining state of Alabama "local rates on freight have decreased very little in the last five or six years, and have not decreased in proportion to the decrease made in interstate rates." In New England comparison of actual freight rates did not indicate any very considerable reduction, the absence of competition in this section being, perhaps, in part responsible for this result. A comparison of published freight rates in southern territory, without making allowance for departures from such tariffs, apparently showed a very much smaller reduction than in other parts of the country. It is also apparently true that the reduction of cotton rates in this section, while considerable, had been much less rapid than that of the rates upon grain from Chicago to the seaboard in either direction. A few instances of an actual rise of local charges since 1900 might be cited.[2] But the fact that competition has been substantially eliminated in consequence of widespread consolidation since 1900, has rendered the movement of local and through freight rates more nearly alike all over the country than they were prior to that time.

The third consideration which must always be kept in mind in the interpretation of revenue per ton mile is the volume of the traffic handled. Any comparison of freight rates which is not made in the light of increase in the business transacted, is bound to be misleading. A reduction of cost of operation per unit, attending a growth in volume, has already been fully described in connection with the theory of rates.[3]

And it is but natural that a reduction in the rate should follow any lessening of cost. Moreover, a large volume of business usually implies a relatively greater amount of low grade tonnage. In order to bring out this relationship the second column in the table on the first page has been added. This permits a correlation between freight density—that is to say, ton miles per mile of line and revenue per unit of service. It will be noted that, in general, the revenue unit falls as the volume of traffic, measured by freight density, rises. This is strikingly shown by comparison of the groups of western and transcontinental roads with those concerned mainly with the carriage of coal and ore. The soft coal Hocking Valley road with its enormous density and very low revenue per ton mile affords an excellent example. It is indubitable that the trunk lines and the coal roads are able to transact business for relatively low rates, not only because their tonnage is of low grade, long haul or both; but also because of its immense concentration per mile of line, permitting all of the economies incident to large-scale operation. In this connection, however, it should be noted, as a general principle, that oftentimes it is not the mere increase in the traffic of a particular sort which is significant; but rather the growth in the total volume of business of all kinds.[4]

The foregoing criticism of the use of revenue per ton mile as a means of showing the course of freight rates in general has been mainly destructive. This figure, nevertheless, will in many cases be found highly serviceable in the examination of particular rates. It may properly be used to determine whether a given commodity is contributing its due proportion to the general budget of the carrier. Revenue per ton mile can, of course, be computed for each particular service; inasmuch as both the income and the volume of that service are matters of independent record. The table of commodities brings out this point. Take the Illinois Central for 1900 for example. Its revenue per ton mile was 0.136 cent on wheat, 0.79 cent on flour, 4.267 cents on sugar cane, 0.309 cent on soft coal, 1.148 cents on stone and sand, 2.238 cents on furniture, 3.165 cents on merchandise. On this basis one may properly inquire as to whether under all the circumstances wheat, coal or merchandise are doing their part, in the light of the particular expenses attached to their carriage, in maintaining the general burden of indivisible costs. When copper yields a revenue per ton mile of only 0.285 cent, the rate being only 1.6 per cent. of its market value, while on wheat for the same haul the corresponding unit of return is 0.4 cent per ton mile—equal to one-fifth of its worth, there is evidently a maladjustment favoring one commodity over another.[1] In a number of recent cases questions of this sort have been rather satisfactorily answered by resort to this unit of measurement.[2]

The curve of revenue per ton mile, as shown by diagram at the head of this article, certainly gives no indication of the appreciable increase of freight rates which has ensued since 1900. This follows largely from the fact that in at least two of the three respects, above mentioned, the trend of events, independent of any change in the level of freight rates, has operated to greatly dilute the revenue per ton mile. The growth of low grade traffic and the immense augmentation in tonnage have both conspired to render this unit entirely useless for purposes of comparison year by year. The average length of haul, alone, seems to have remained much the same during the decade. Although the curve does not show it, there has been an appreciable upward movement, responsible in a measure for much of the new federal legislation. As to the precise amount of this change, opinions may honestly differ. But certainly some accurate method of registration ought to be possible. How may we, then, estimate the amount of these increases? Under such circumstances, it is necessary to turn to the movement of actual rates.[3] The course of these down to 1900 is best shown upon the same diagram, above mentioned, by means of the dotted curve entitled Actual Rate Index, the scale for which is given at the right.

This rate index is simply the average of the actual published rates for a number of specific commodities between certain given points. It differs in principle from the ton-mileage revenue curve, in that it concerns merely the published rates, taking no account of rebates or departures from those rates in actual practice. A comparison of its course with that of the ton-mileage curve shows a more abrupt decline from about 1878 to 1886, since which year the course of both lines is about parallel. Its irregularity is also significant as illustrating the violent fluctuations to which the published rates were subjected prior to 1887. Judged by this curve, the situation has been more settled since the enactment of the Act to Regulate Commerce in 1887.

Were data at hand for a continuation of this line to 1910, it would undoubtedly afford a fairly reliable measure, in general, of the substantial increase of rates which has taken place during the decade. The main objection to it would be that it did not weight the average according to the volume of the business carried in each of the twenty-seven concrete rates chosen. The continuation of Commons' index number of Freight Rates to date, seemed inadvisable on account of the changes in traffic conditions which have taken place. Originally well selected, the 37 rates chosen in 1900 are not now representative. There are, for

[1] McCain, in Senate Finance Committee Report on Prices, 1893.

[2] I. C. C. Annual Rep., 1903, p. 150.

[3] The various articles which have appeared in the *Railway Age Gazette* will shortly be published in book form as Railroads; Rates and Regulation; to be followed by Railroads; Finance and Corporate Organization, in a second volume.

[4] Emphasized in the case of wool rates. 23 I. C. C. Rep., 151.

[1] Samuel O. Dunn, *American Transportation Questions*, p. 65.

[2] 22 I. C. C. Rep., 617; 11 I. C. C. Rep., 296; 13 I. C. C. Rep., 418; 23 I. C. C. Rep., 7; 9 I. C. C. Rep., 382; etc.

[3] I. R. Commons, *Bulletin, Bureau of Economics Research*, No. 1, July, 1900; unfortunately not continued to date.

The best data giving actual rates and classifications is the *Forty Year Review*, etc., published by the Interstate Commerce Commission, as "Railways in 1902," Part II, 1903; continued in Senate (Elkins) Committee, Digest, App. II, 1905; and 58 Cong., 2nd sess., Senate Doc. No. 257; savagely attacked in Bull. II, Chicago Bureau of Railway News and Statistics, 1904. The largest collection of material is in the Senate (Aldrich) Committee Report on Prices, 1890, I, pp. 397-658, covering the period 1852-'90. Also Bulletin 15, Misc. Series, Div. of Statistics, U. S. Dept. of Agriculture, 1898, pp. 1-80. The earlier data is also reviewed historically as well as in connection with rate wars in *Railroads: Rates and Regulation*, shortly to be published.

instance, no transcontinental quotations at all; none from the southern states, such as on raw cotton; none for the great staples elsewhere moving under commodity ratings, such as iron ore, chemical fertilizers, lumber, citrus fruit, etc. Moreover, 12 of the 37 items chosen by Commons were rates on petroleum which now moves in bulk in pipe lines except locally. Several of the quotations for coal, and for all the other carload rates, as a matter of fact, have been so affected by changes in carload minimum rules, that the mere rate by itself has little significance.

Rejecting Commons' particular index number by reason of its inherent defects does not, however, lessen the desirability of choosing some other combination of rates which may be used as a standard for measurement of rate changes year by year. Yet the selection of such an index number is open to all the difficulties attaching to a similar index number of prices. Is the object, for example, an academic determination of rate changes *per se;* or is it intended to ascertain the financial burden of such charges upon the community? In the former case the volume of traffic affected would not be an important consideration. Local rates on indigo or millinery would be given the same weight as similar changes in the rate on wheat between Chicago and the Atlantic seaboard. The latter mode of approaching the question, on the other hand, would correspond to an index number of prices, weighted according to the volume of consumption. A doubled freight rate on hard coal to Perth Amboy would outweigh an equal change in the charge on castile soap in exact proportion to its commercial importance as measured by the total tonnage transported. Many such details would call for careful consideration before the final adoption of the rate items chosen to constitute the index number; but the Interstate Commerce Commission might well consider the initiation of such a statistical project, endeavoring to do for railroad rates what the federal commissioner of labor performs so satisfactorily in officially recording current changes in the price of commodities. Such a record of railroad rates extending over a series of years, supplemented by data for ton mileage revenue, would be invaluable in the determination of the reasonableness of rate advances in future; even as the rate increases of 1910 clearly pointed to the need of a similar standard for purposes of comparison from year to year in the past.

Tracing the rise of actual rates since 1900 is rendered peculiarly difficult, also, by reason of the fact that few of the changes took the form of an outright advance in charges. The end in view was more often accomplished indirectly. The substantial increases in 1900[1] which inaugurated the upward movement were mainly accomplished by changes of classification. Modification of the carload ratings brought about the same result. A notable instance appeared in the complaint of the dairy men in Wisconsin in 1909. An annual shipment of 38,000,000 lbs. of cheese to Chicago before 1899 moved at 20 cents per 100 lbs., irrespective of the size of the consignment. Ten years later the rate had become 28 cents for less-than-carload lots, and 22½ cents for wholesale shipments. The relative disability of the small shipper under the new circumstances is as significant as the rise of rate for all.[2] The increase of charges might be brought about in another way without actually advancing rates by a withdrawal of commodity ratings, thereby subjecting the shipper to the higher scale of classified commodities. And, finally, partial elimination of the rebate and the cessation of general rate wars has usually resulted in a very substantial increase in the revenue of the carriers as well as in the scale of charges imposed upon most shippers. Evidence upon this point is officially given in connection with the rate increases of 1903.[3] It thus appears that to follow step by step the movement of actual rates is an extremely complicated matter. Every factor entering into the determination of the charge must be considered: the distance tariff, the classification, minimum carload rules and a host of other specifications which enter into the final result. For our purposes it must suffice that the fact of a substantial change in charges all along the line since the turning point in 1900 is beyond question. Naturally enough, the rate increases, arousing vehement protest among shippers, have been more widely advertised than the changes in the opposite direction which have not infrequently occurred, especially in the rates on low-grade staple commodities. In absence of dependable data, one is almost in doubt as to the extent of the change which has taken place.

The movement of passenger fares has been quite different from that of freight rates.[1] No marked decline during the last quarter of the nineteenth century took place. Growth in the volume of traffic was not accomplished by a reduction of charges. This is in consonance with the experience of foreign countries. Passenger business, while steadily growing, has decreased less rapidly than freight tonnage. Generally, in other words, as measured by volume, freight business has become relatively more important with the progress of time. Fiscally the same thing is true. Only in New England does the revenue from this service approximate one-half of the total net earnings. The nature of railway competition explains why passenger fares have not decreased as rapidly as freight rates. Persons must necessarily be more or less directly transported from one point to another, while experience shows that competition in freight traffic may be exceedingly circuitous in route, goods even going hundreds of miles out of the direct line for transportation by water. This narrowing of the sphere of competition in the case of passengers has consequently operated to lessen the rate of decline. Another point to be considered in this connection is that no such increasing economies in the handling of passengers are possible as in the case of freight. Instead of decreasing the proportion of dead weight, which for passengers amounts to upward of 90 per cent., by any of the economies recently applied to freight traffic, it appears rather that the proportion of dead weight of equipment per passenger is increasing, owing to the necessity of providing more sumptuous accommodations. Bearing in mind all these facts, it appears not unreasonable that the progressive decline of passenger fares has continually lagged behind the decrease of freight rates. But the natural lethargy in the movement of passenger fares was rudely interrupted in 1908 in connection with the wave of legislation accompanying the Roosevelt campaign which led up to the Hepburn law in 1906. A widespread demand for lower passenger fares found expression in the passage by twenty-two states within five years of maximum fare laws. Eleven legislatures fixed the charge at two cents per mile, the others establishing it at less than three cents. Many appeals to the courts in connection with these statutes took place on the ground of confiscation, and sharp conflicts of authority between federal and state government arose. Whether passenger rates would ever have declined without such exercise of authority is open to question, but the disturbance of established conditions at this time was extreme.

One further question with relation to the movement of rates merits consideration. In how far has the rise since 1900 been commensurate with the general upward movement of prices of other commodities than transportation—the particular commodity produced by railways. The evidence tends to show that prices in general have moved upward during the last ten years be approximately one-fourth, and it may be even one-third.[2] Have railway charges in general surpassed this rate or not? Some activity of railway experts has been devoted of late to the elucidation of this question.[3] But after all, is this inquiry of

[1] U. S. Industrial Commission, XIX, pp. 281-291; 58th Cong., 2nd sess., Sen. Doc. 257, 5.

[2] 16 I. C. C. Rep., 85. For other instances compare 12 I. C. C. Rep., 149, and 23 I. C. C. Rep., 158.

[3] 9 I. C. C. Rep., 382.

[1] *Annals of the American Academy of Political Science,* 1898, pp. 324-352.

[2] *Quarterly Journal of Economics,* 1907, p. 618.

[3] Calculations of C. C. McCain on the Diminished Ratio of Railway Rates to Wholesale Commodity Prices, in connection with the increases in 1910.

basic importance as bearing upon the general reasonableness of railway rates? Here, as so often elsewhere in the discussion of these questions, the need is for the analysis of such problems with reference to particular services, and not in connection with matters in general.[1] It is conceivable that railway rates might and properly ought to increase under certain circumstances much more than in proportion to the general change in freight rates; or that, on the other hand, they might fairly be compelled to lag behind. This introduces the larger question of reasonable rates in general which must remain for discussion in our second volume.[2]

TESTS OF TURPENTINE SUBSTITUTES.

The test committee of the Railway Master Car and Locomotive Painters' Association made an interesting report of tests on turpentine substitutes at the recent convention at Denver, Colo. An abstract of the report follows:

The test consisted of 8 substitutes and pure turpentine. The panels were exposed June 9, 1911, and examined June 1, 1912, with the results in favor of the pure turpentine. The eight samples really represented three general types of turpentine substitutes, viz., wood turpentine, petroleum spirits from a parafin base, and petroleum spirits from an asphalt base. One or more of these three formed the base for the bulk of substitutes on the market at the time the tests were started. The accompanying table shows the physical properties of each sample, price per gallon, and the standing at conclusion of test.

The excellent showing made by the eight substitutes after 12 months' exposure is remarkable. Sample *A* is the pure turpentine, and as will be seen it gave the best results. It seems to have made no difference as to what the base of the substitute was, for they all stood up remarkably well. For instance, sample *E* finished second in the test, and it was made of petroleum spirits from an asphalt base; sample *G* finished third, and it was made of petroleum spirits from a parafin base; sample *B* finished fourth, and it was made from a wood base. The very little difference in the results obtained from these three kinds of substitutes would indicate that the base of the substitute has little to do with the quality of the finished product.

Looking at these three substitutes from a flash standpoint we have sample *E* with a flash at 96 deg. F.; sample *G* with a flash at 114 deg. F.; and sample *B* with a flash at 98 deg. F., which would indicate that the flash point is not a proper gage for determining the relative value of a substitute. The specific gravities of three samples *E, G* and *B* were respectively .823, .831 and .843, while pure turpentine runs about .866. This also proves that it is necessary to have a practical test in order to determine the real value of the material. The working qualities of samples *B, C, D, I,* were similar to that of pure turpentine with the exception that neither of the samples flattened out like the pure turpentine. Samples *E, F. G,* were much slower drying than the pure turpentine. Sample *H* dried more rapidly to the touch than pure turpentine, but when followed up with a succeeding coat it showed a tendency to soften. This was more or less true with all the operations from priming to color coats, which were the same as standard treatment given to passenger cars on the Norfolk & Western. At the time this test was started pure turpentine was 98 cents per gallon, which of course made the substitutes more interesting on account of price, but since pure turpentine has dropped to 46 cents a gallon. As long as pure spirits of turpentine remain around the 50 cent mark it will be given preference by the majority of the painters. Should it advance rapidly in price, as some two years ago, we will have some intelligent information on which to base our future actions.

[1] Well expressed in a recent soft coal case; 22 I. C. C. Rep., 617.
[2] Railroads: Finance and Corporate Organization, in preparation.

No.	Color.	Odor.	Specific Grav.	Flash, degs. F.	Boiling point degs. F.	Residue on evaporation (per cent.)	Insoluble H_2SO_4 test (per cent.)	Base.	Price.	Finish at conclusion of test.
A	Water white	Pine	.866	103	320	.0043	20.0	Rosin	$0.98	First
B	Water white	Pine	.843	98	320	.0043	56.7	Wood	.38	Fourth
C	Water white	Oily	.793	97	300	.0016	98.3	Par.	.27	Eighth
D	Prime white	Oily	.818	98	305	.0004	100.0	Asph.	.18	Ninth
E	Pale yellow	Pine	.823	96	310	.0007	95.0	Asph.	.23	Second
F	Prime white	Oily	.778	86	280	.0002	98.3	Asph.	.14	Seventh
G	Water white	Pine	.831	114	336	.0049	96.7	Par.	.30	Third
H	Water white	Oily	.766	110	340	.0020	100.0	Par.	.11	Fifth
I	Water white	Pine	.832	105	318	.0060	93.4	Par.	.37	Sixth

HANDLING FREIGHT CLAIMS ON THE CINCINNATI, HAMILTON & DAYTON.

Numerous theories have been advanced as to what department of a railway should investigate and adjust losses of and damage to freight shipments. That there exists a wide difference of opinion on this subject is shown by the fact that this work in various instances is under the jurisdiction of the traffic, accounting and operating departments. One of the roads that has proceeded on the theory that the transportation department is the proper department to handle freight loss and damage claims is the St. Louis & San Francisco. A description of that company's freight loss and damage bureau was published in he *Railway Age Gazette* of July 26, 1912, page 162. The Cincinnati, Hamilton & Dayton, proceeding on the theory that the traffic department is in closer touch with the shipping public than any other, and is therefore in a better position to appreciate the importance of prompt claim settlements, has its freight claim office under the jurisdiction of that department.

After considering the subject from various aspects the Cincinnati, Hamilton & Dayton on August 1, 1911, adopted a system for the handling of shipments checking over, short and damaged, in the effort to prevent to as large an extent as possible O. S. & D. reports, which in the year since has proved very simple, has reduced the work at local stations in handling O. S. & D. reports by approximately 25 per cent., and affords the freight claim department an absolute record of all shipments short, over or moving astray on the road.

Of the shipments over and short 77.3 per cent. are currently matched or record of deliveries established, and complete O. S. & D. files to cover 89 per cent. of the claims presented on L. C. L. freight are kept in the office. As information is in the possession of the freight claim department, it is unnecessary to investigate (except for unusual claims) thereby relieving the agents or other outside parties of additional work.

Information is regularly furnished the transportation department regarding errors at local stations in waybilling or forwarding of waybills, errors in loading, or unloading, bad or improper storing of freight in cars, improper handling by train crews, such as carrying freight past stations to which it is consigned or not properly handling the freight at the time shipments are unloaded or reloaded at the various way stations. Under this plan, no attempt is made to criticise an employee, but errors are brought to the attention of those responsible for them in order to prevent recurrences. The employees are co-operating heartily in the effort to avoid errors. The agents at both large and small stations take a personal interest in the work, and there seems to be considerable rivalry as to who can make the best record by having the least errors charged to the respective stations. Notwithstanding the fact that a record of errors is sent out currently, the freight claim department also issues monthly

statements of discrepancies, allowing each employee to see the record.

Since its adoption this system has reduced claims for loss of entire packages 57 per cent., it is stated, and for over astray freight 71.7 per cent. The percentage of loss and damage to gross freight earnings since its inception has been reduced to .97 per cent., or in other words, as compared with the period prior to its inception, there has been a reduction of 16.4 per cent. in the amount charged to the account of loss and damage claims paid. It is hoped that this percentage may be reduced to .75 per cent.

Under this system it has been found that 71.3 per cent. of claims are settled within fifteen days, and 81.8 per cent. in thirty days; or in other words, the number of claims unpaid at the end of a month is only 18.2 per cent. The percentage of complaints received regarding the nonpayment of claims is very small. The employees of the claim office have been thoroughly drilled in their work, and when a claim is presented and liability ascertained payment is made at once, irrespective of what carrier is responsible.

INTERSTATE COMMERCE COMMISSION REPORT ON HYDE PARK DERAILMENT.

The Interstate Commerce Commission has issued a report, dated September 4, giving the conclusion of Chief Inspector Belnap and Engineer Howard on the derailment which occurred March 31, last on the New York Central & Hudson River at Hyde Park, N. Y., when the southbound Twentieth Century Limited Express train ran off the track and five of its cars fell to the ice-covered Hudson river and 73 passengers were injured.

We give those parts of the report which throw additional light on the cause of the derailment, most of the facts having been given in our issue of August 2, page 214, when the New York State Public Service Commission made its report.*

The rails of the track are 100-lb., with an average of 20 pine ties under each rail. A small part of the ties had been treated with creosote, and these treated ties had tieplates. The ballast was crushed limestone. The rails were double spiked on the outside and single spiked on the inside. Each pair of angle bars was held in place by six bolts. Mr. Belnap says that the drainage was poor, but, like Mr. Vanneman, he does not go into details on this point. The track had been repaired the day before and shims were put under some of the rails. Some had been put under the rail which broke, but none north of that rail on the previous day.. However, there were some shims, evidently placed previously, under the rail immediately north and in the vicinity many shims were used, varying in thickness from ¼ in. to 1 in. Photographic views are given of shims in the track, and some of these are 1 in. thick, but it is not stated that any so thick as that were in the track where the derailment occurred, and the New York report states definitely that there were no shims under the west, or higher rail at the point where the derailment occurred, and the foreman of the section said that no shims over ¼ in. in thickness had been used on the west rail at that point. The thickest shims shown in the photographs are shown to have been on the northbound track and at a point (track not specified) a considerable distance away from that where the derailment occurred. It is stated that the super-elevation for 600 ft. north of the point of derailment varied from 3½ to 4½ in. The location of the different measurements is not given, as in the New York report, and the length, 600 ft., is greater than that inspected by the New York inspector. The conclusion as to the cause is that it was due to the use of shims, together with irregularity in the track; the outside rail was forced outward probably by the engine; but the first wheels to drop to the ties were the rear wheels of the tender.

The New York commission examined the broken rail and found no flaw in the metal, and after having made drop tests said that it was of "excellent quality."

The Interstate Commerce Commission also had the broken rail examined, notwithstanding the conclusion of both boards that the breakage was not the cause of the derailment. Engineer Howard tested pieces of the rail after they had been tested by the New York commission and found small seamy streaks in the pieces taken from the base of the rail, and he repeats the recommendation which has been made in reports on accidents before this that rails should be tested not only longitudinally, but by crosswise bending. He also says that specifications for steel rails should prescribe a value for tensile strength.

As to the immediate cause of the derailment Mr. Howard is less explicit than the other inspectors. He says that the probable primary cause was the insufficiency of the spiking to maintain the rails in place against the outward thrust of the engine; and that a conjectural explanation of the weakness of the spiking is the probability that the track had been shimmed.

*The New York report gave the cause as irregularity in the elevation of the outer rail of the curve. The curve was one of 2 deg. to the left and the prescribed superelevation was 4 in. The inspectors of the New York Commission, Messrs. Vanneman, Buchanan and Gill, took readings for about 125 ft. where the derailment occurred and they reported as follows:

Reading No.	Position.	Super-elevation.	Remarks.
1	Center	3⅞ in.	
2	Joint	3⅞ in.	
3	Center	4 in.	
4	Joint	4⅛ in.	
5	Center	4½ in.	
6	Joint	3½ in.	
7	Center	3 1/16 in.	
8	Joint	2¾ in.	Marks of first derailment on the ties near the east rail.
9	Center	3⅛ in.	
10	Joint	3⅜ in.	Position occupied by broken rail.
11	Center	3 9/16 in.	
12	Joint	3⅝ in.	
13	Center	3 3/16 in.	

The report does not say when these readings were taken, but presumably the inspection was made within a few hours after the derailment. Vice-President A. H. Smith, of the New York Central, sent a protest to the Commission in which he stated that readings of the superelevation made by his engineers disagreed at one point with those taken by Mr. Vanneman to the extent of 15/16 in. Mr. Smith's letter was printed by the commission in its report, but no reply or comment was made relative to Mr. Smith's criticism. The report said that the uneven condition of the track had existed for twelve hours prior to the derailment, but the evidence sustaining this statement was not given and Mr. Smith in his protest says that that conclusion is clearly an assumption. A trackwalker had been over the road thirty minutes prior to the accident but reported no evidence of any trouble. The report said that the drainage of the track was "somewhat deficient," but no details were given to enable the reader to see the basis for this statement.

Proposed Extension for Chinese Railway.—An extension is proposed of the Sunning Railway from Sunning south to the sea at Yeung Kong west of Hongkong. The Sunning Railway has about 70 completed miles centering in Sunning, the center of a district northwest of Hongkong in the Pearl river delta, from which most of the Chinese in the United States have come and in which there are many wealthy Chinese who are progressive and have some knowledge of foreign ways. This railroad was constructed by Chin Gee Hee, who acquired his knowledge of the railway business by active construction work on the Northern Pacific and other northwestern railways of the United States many years ago, and who constructed this line largely with money subscribed by Chinese now in the United States. This line is completed from Sunning to Kongmoon on tide water and in the other direction south to Sam Kap Hoi in river connection with Hongkong. The line to the seaboard to the south was a part of the original plan. The completion of the line to the north, effected largely without indebtedness, now permits undertaking the longer line to the south. Capital for this extension is now being raised, to a considerable extent, among Chinese in the United States. The extension will run for about 90 miles, and it is expected that it can be built for about $3,000,000, two-thirds of which will be raised by stock subscriptions. There are no engineering difficulties in the way and the country it will draw upon is rich and prosperous above the average. It is expected that active construction on the extension will commence this year.

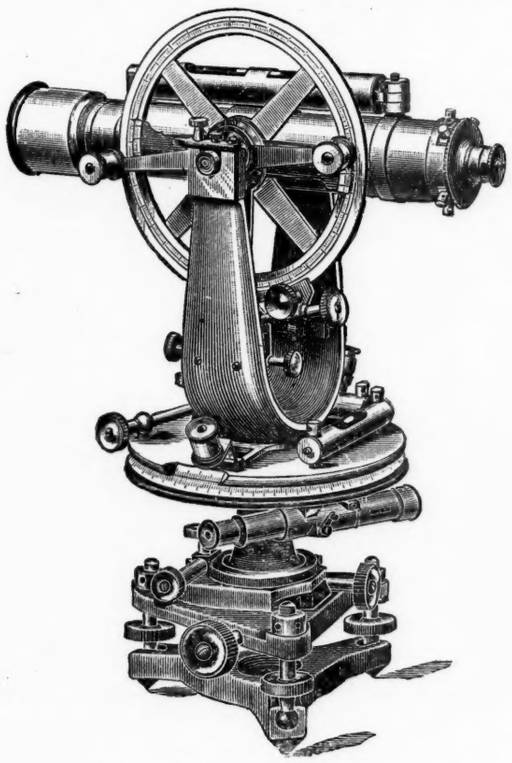
THE TACHEOMETER IN RAILWAY LOCATION.

Accurate Levels Over Wide Areas May Be Obtained Rapidly, Making Possible Better Results Than by Present Methods.

By E. R. Lewis.
Assistant to the General Manager, Duluth, South Shore & Atlantic.

The railway world of today benefits by the high state of efficiency in construction, maintenance and operation attained during fifty years of successive rapid improvements. Yet in this whirl of achievement there appears little real advance in the science of surveying and the method of location, which is least in cost and most important in effect of all the larger details of railway building, has seemingly received scant attention.

Few railways in this country have ever been located in any other than a hurried manner. Engineers in charge of surveys of great ultimate importance have been so continually harassed by promotors and urged by their superior officers to show results quickly, that speed has displaced thoroughness. Their professional work has been hampered by lack of funds for the purchase of effective instruments and appliances, for the hiring



A Standard 6-inch Tacheometer.

of competent assistants and for extending mature investigations over wide territories. It is much to the credit of the engineers that the results obtained in spite of these conditions have so well stood the test of time. The civil engineering profession is nevertheless at fault for not correcting these abuses. The promoter of a railway is not required to be a man of engineering ability or technical education. He therefore necessarily depends on his engineers for advice in their specialties. It is, then, within the province of the engineer to insist on sufficient time and money for those necessities without which thorough investigations cannot be made and he should gain command of such equipment as to give his employers results that cannot be bettered.

Of the many millions of dollars spent for betterment work on American railways, a large percentage would have been saved, had the engineers who located these roads insisted on, and their employers recognized the importance of, thorough preliminary investigations made with the aid of instruments more accurate than the ordinary transit and "an eye for country."

Although the methods here described are known to some American engineers, it is a fact that nearly all American railways are today built on lines located in the same way and with much the same instruments as were used in the ante-bellum days of early transcontinental railway construction. The preliminary traverse with its single line of horizontal measurement, and its one line of levels laboriously obtained with transit and chain, level and rod; and with topography approximated by means of chain, hand level and slope board; is still the chief guide to railway location in this country. Meanwhile, European engineers have for a lifetime benefited by the vastly more accurate methods of tacheometry, which admit of obtaining accurate levels over wide areas, at a very rapid rate.

Tacheometry, meaning literally "speedy measurement," may be defined as the science of exact determination of elevations and locations of points necessary to the development of accurate contour maps. The horizontal and vertical angles from known to unknown points are obtained by means of an improved transit theodolite called a tacheometer. Through the improved telescopic lens of this instrument a suitably graduated stadia rod may be read at distances of half a mile. A fair day's work in the field is one mile along the proposed route. Therefore if such breadth of mapping is desirable, it is possible to obtain a square mile of topography each day. It is plain that preliminary contour maps covering even 200 ft. on each side of the located line of a railroad are of great value for all time. Yards, station grounds, sidings, waterways, buildings, drainage schemes, may all be located as occasion demands without further necessity for preliminary surveys, so long as the original tacheometer notes are preserved. After the plotting of the contours, only paper locations are necessary for any structure within their limits.

The tacheometer is essentially a transit theodolite with an anallatic telescope. The telescope is large and the lenses are powerful magnifiers. The arrangement of the lenses is the invention of J. Porro, an Italian professor of Milan, who first made practical use of it in 1823.

The object glass of the tacheometer is arranged to focus well in front of the axis, the rays of light crossing before reaching the anallatic lens, which, being of focus identical with the object glass, the rays having crossed from equal refraction, may extend parallel from the diaphram to the lens. The focus being constant, there is no constant to be added to stadia measurements. Two stops in the telescopic cut off all eccentric rays, doing away with internal reflections from the tube of the telescope.

The tacheometer survey is based on reconnaisance. A traverse or instrument line may be extended as the survey progresses the distances being determined by checked stadia readings; and further checked if desired, by a line of bench marks run ahead of the tacheometer. The rods used with the tacheometer should be at least 16 ft. long, and plainly marked similar to the Philadelphia rod. Targets are of little value and may be dispensed with.

The survey party should be made up of an engineer in charge of the survey and two assistants in addition to rodmen and axemen. One assistant manipulates the instrument and reads the angles and stadia aloud to the second assistant, who records these readings in the field book. From two to four rodmen

will keep the tacheometer operators remarkably busy. The most expert operators rarely use more than four rodmen even in open rolling country. Axemen are of course necessary to drive stakes at instrument stations and to clear brush from the lines of sight between the instrument and the rods as placed Long rods are of great advantage, as much time is often saved by taking readings over the tops of intervening obstructions several feet in height.

FIELD WORK.

After determining the variation of the magnetic needle and setting the tacheometer over a point of known latitude, longitude and altitude, the height of the axis of the instrument above the stake it sets over is first measured. Stadia observations and horizontal and vertical angle readings are then recorded from the level rods held successively at all points of topographical importance within view in all directions from the instrument station.

The rodmen are usually placed by flag signals, the distances being too great to guide the men by sound. Experienced rodmen will hold the rod at the successive breaks of ground with little necessity for directions from the operator. It is desirable to have main points on the contour maps approximately equidistant, though any number of intermediate points may be observed, such as the beds and banks of streams, angles in roads, fence and building corners.

It is of advantage to take readings always from right to left or from left to right around the instrument station, at last stopping all rodmen where they may be plainly seen from the next instrument station. After setting and reading to this station, the tacheometer is moved from station O to station I, reset, and the distance of axis above the hub read. The needle course, level and stadia distance are then read from I to O and checked with readings from O to I. The rods still in the positions last read from station O are read from station I as a further check, and so on. The axeman who drives the instrument station stakes carries a picket or ranging rod for setting the stakes and points accurately.

A careful sketch should be kept in the field book showing the approximate positions of the points observed from each instrument station, by numbers corresponding to the numbers entered opposite the stadia and angle readings of the same points on the opposite page.

It is evident that the instrument stations need not necessarily be along the line of reconnaisance. It is quite feasible, for instance, to run a tacheometer traverse on bare level ground on one side of a stream, taking observations on rods held on points along a wooded cliff on the opposite side where a location is desired.

The immense advantages of easy going for the instrument operators and the elimination of heavy cutting of continuous lines through the woods and of frequent difficult setups along a cliff side are readily discernable to any experienced locator.

The object of having the zero of the vertical circle of the tacheometer at the top rather than in the horizontal line, is to avoid confusion as to whether the vertical angles observed are rises or falls. Observations are taken and entered in the field book in regular order, first, the horizontal angle or bearing; second, the vertical angle; and lastly the stadia readings. It is often necessary to read the top stadia and center hair or the center and bottom hair on account of some obstruction. An exponent "2" opposite such readings indicates that the reading must be doubled. For convenience the bottom hair is brought invariably to an even foot mark on the rod—the uneven tenth or hundredth being read off the top hair.

OFFICE WORK.

Reduction of field notes to obtain true horizontal and vertical distances from the stadia observations at varying angles may be done by means of a slide rule, tables or diagrams. The Stewart and Gillman diagrams offer the best and quickest methods of reduction. The heights of instrument at the various stations must be given consideration, because all angles are taken from the axis and refer thereto. The height of instrument must therefore be subtracted from or added to the reduced levels of all points to obtain the true levels. The semicircular, transparent, double indexed protractor and the elastic contour spacer are aids to rapid plotting.

The finished contour plan usually shows land contours in burnt sienna, each fifth line heavy and figures corresponding to elevations of contour lines at convenient spacing on the map. Under water contours are shown in blue. From accurate contour maps it is of course easy for an engineer to plot a perfect line of railway on paper in the office. There should be no variation from the tacheometer survey so great as six inches in the line as finally located in the field from the paper location, while the scope and accuracy of the information obtainable by tacheometer is unattainable by the single traverse method.

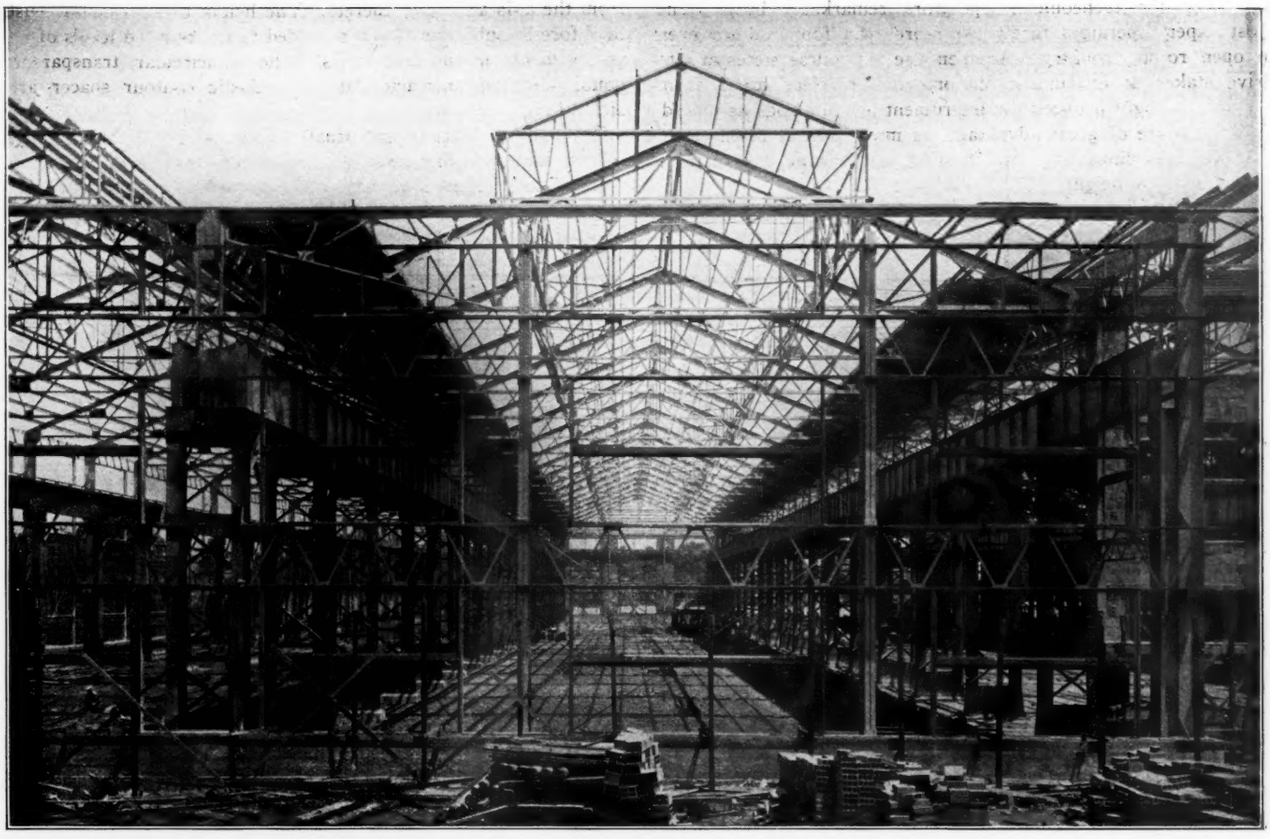
BUILDING LARGE LOCOMOTIVES.

A large new erecting shop, a small part of which was built by the Baldwin Locomotive Works at Eddystone, Pa., two years ago, has just been completed. From the standpoint of construction and arrangement, it is a most bold and unique conception. The completed shop will cover 7.59 acres and will be used entirely for erecting purposes, the greatest attention having been given to the routing of material from the time it enters the building until it leaves in the form of a finished locomotive. Although the building is of strong and durable construction and is thoroughly equipped with the necessary cranes, the cost per square foot is moderate as compared with recently constructed locomotive repair shops.

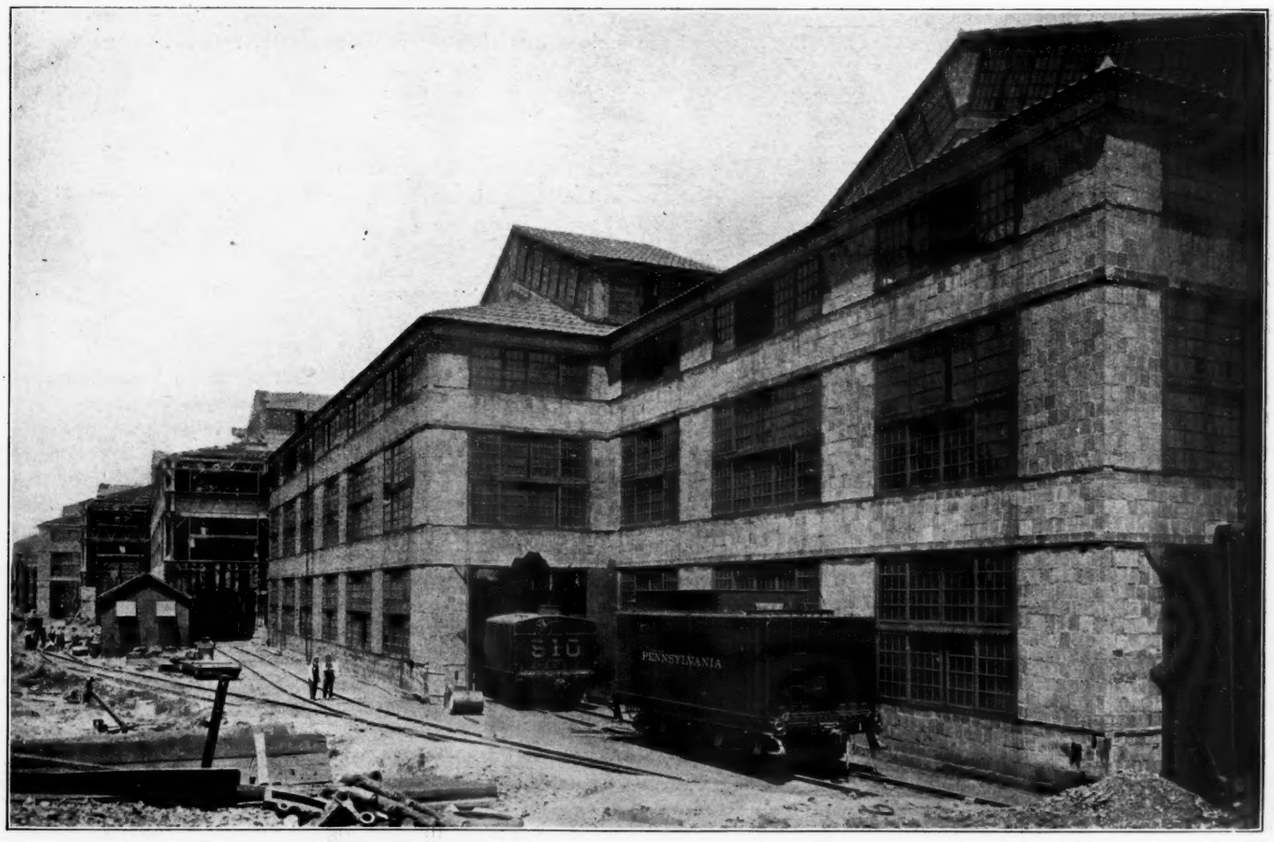
In order that the work which is to be done in this building may be thoroughly understood, it may be well to refer briefly to

The End of the Eddystone Erecting Shop from Which the Finished Locomotives Are Removed.

the other parts of the Philadelphia and the Eddystone plants which feed material to it. The Baldwin plant in Philadelphia is located in the heart of the city and has gradually been added to from time to time as the business has developed. The first building was placed on the present site by Matthias W. Baldwin in 1834, in which year five locomotives were built. The plant was gradually added to until it covered most of the property between Broad street and Eighteenth street, a distance of four blocks. A part of this was at one time occupied by the Norris Locomotive Works, at Seventeenth and Buttonwood streets, This property was purchased by the Baldwin Locomotive Works in the early 70's and has since been used for building tanks and trucks. Another tract was acquired in 1902, located at Twenty-sixth street and Pennsylvania avenue. Buildings were here erected, known as the Twenty-sixth street shops; these are used largely for putting the finishing touches to the locomotives, and since the very large locomotives have been developed a large part



One of the Transverse Sections of the Erecting Shop, Showing Steel Construction and Crane Runways.

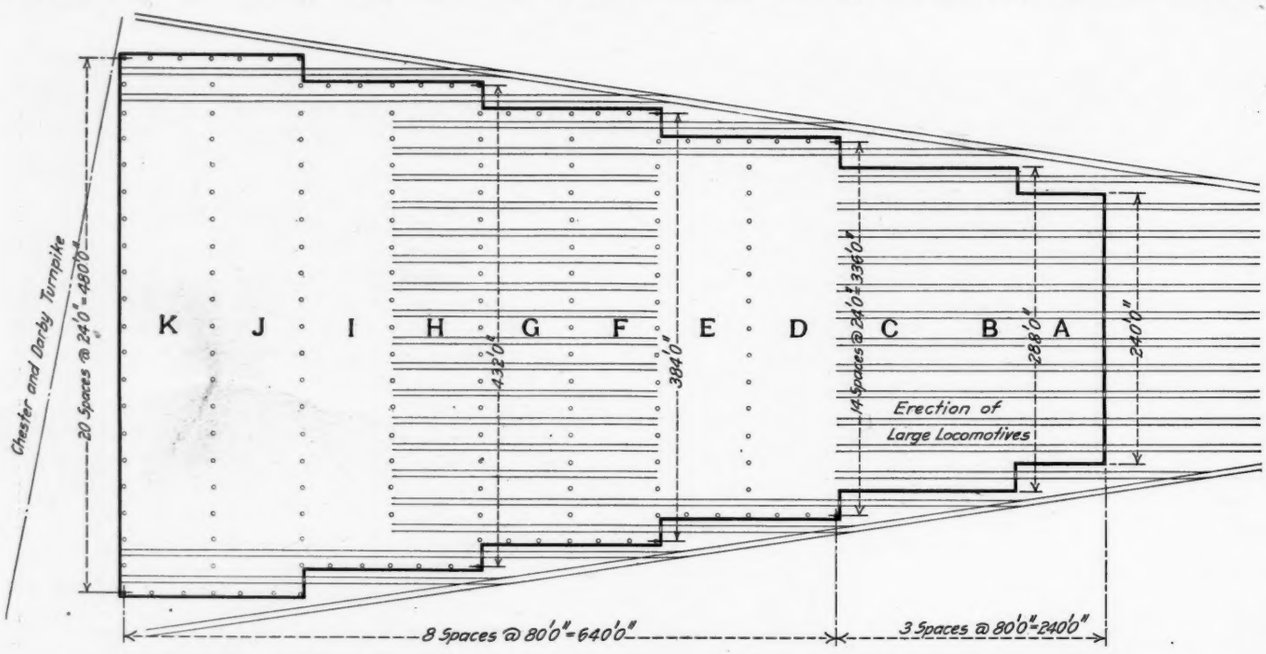


One Side of the Erecting Shop Showing the "Step" Arrangement.

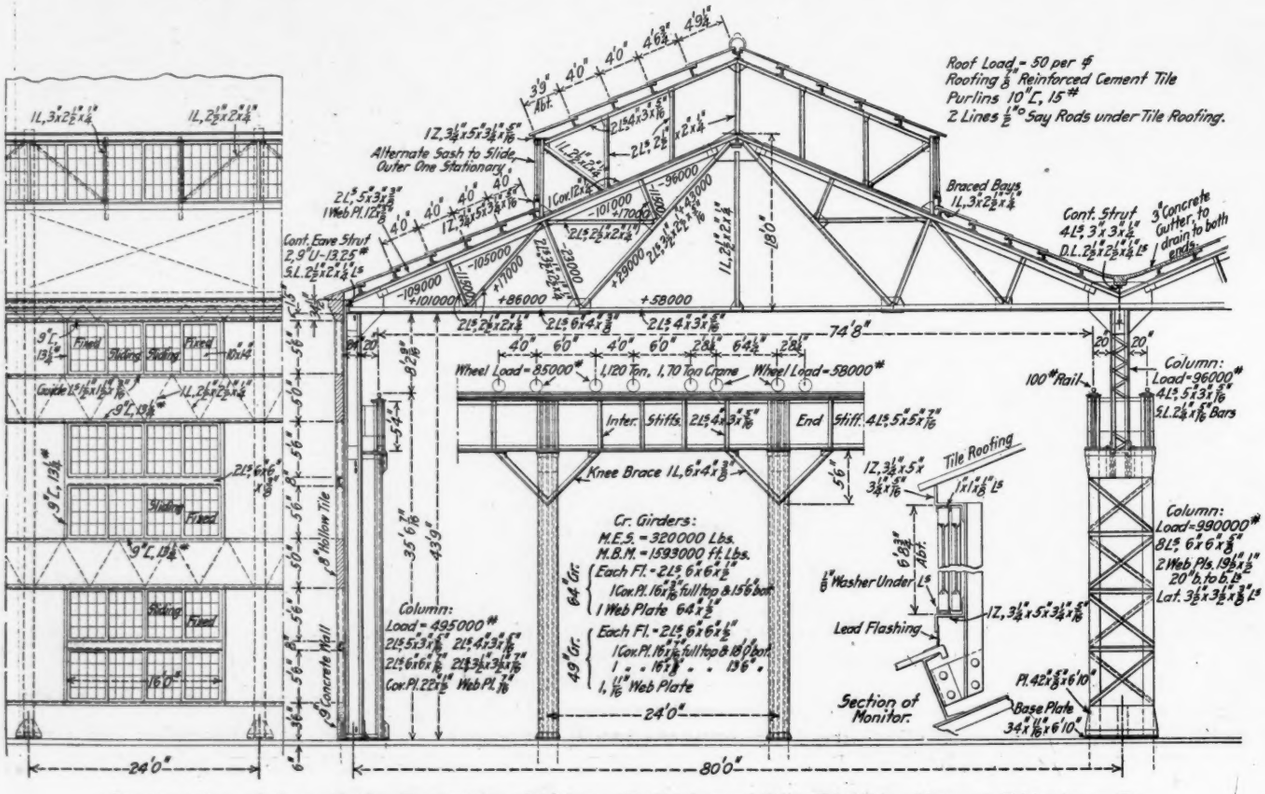
of the erecting work on them has been done in the finishing shop at Twenty-sixth street because of its being impossible to get them out of the old plant when fully erected.

Some idea of the congestion of the Philadelphia plant may be gained from the fact that although it covers only about 17 acres of ground, there is a floor space in the various buildings of over 64 acres, or almost four acres of floor space to one acre of ground. When the nature of the work of building locomotives is considered, this is rather remarkable. As the very large locomotives have been introduced within the past few years, the erecting plant has become entirely inadequate and the locomotives have had to be partially dismantled in order to get them out of the works.

Foreseeing the necessity of a considerable extension, and no more ground being available near the main plant in Philadelphia, the company a few years ago purchased a large piece of land at Eddystone, 12 miles from Philadelphia. The first buildings to be erected consisted of a gray iron foundry and the necessary pattern and storage buildings, and also facilities for handling the blacksmith work, most of which was transferred from Philadel-


Chester and Darby Turnpike
20 Spaces @ 24'0" = 480'0"
K J I H G F E D C B A
432'0"
384'0"
14 Spaces @ 24'0" = 336'0"
288'0"
240'0"
Erection of Large Locomotives
8 Spaces @ 80'0" = 640'0"
3 Spaces @ 80'0" = 240'0"

Plan Showing Peculiar Arrangement of Baldwin Locomotive Works Erecting Shop at Eddystone, Pa.

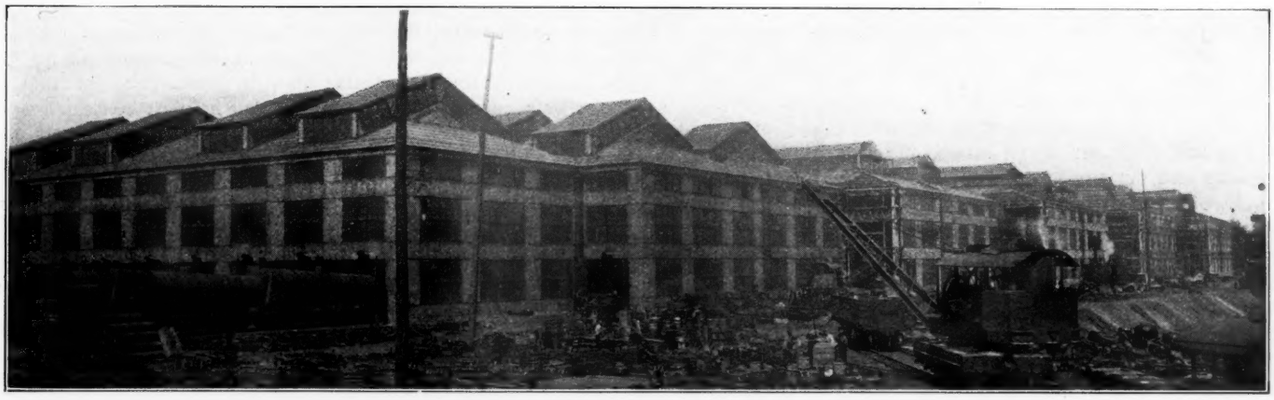


Construction of One of the Transverse Sections of the Locomotive Erecting Shop at Eddystone, Pa.

phia. All of the gray iron castings are made at Eddystone, the present output amounting to from 1,600,000 to 2,000,000 lbs. per week, and practically all of the smith shop and forge work is also done at two shops at Eddystone. All of this material is shipped to Philadelphia for finishing and a large part of it is reshipped to Eddystone for erecting purposes after it has been machined. While this may appear to be an expensive process, it is really less expensive than it would be to handle it back and forth between the different parts of the Philadelphia plant. The train service between Eddystone and Philadelphia is good and the parts are loaded at Eddystone so that they go direct to the proper departments at Philadelphia.

The Philadelphia erecting shop will hereafter be used for light locomotives and those for export, while the larger ones will all be erected at Eddystone. All of the boiler shop work will be done in Philadelphia, but the parts of the boilers for the larger locomotives will be shipped, knocked down, to Eddystone and will be erected there.

There are two points of special interest concerning the plant at Eddystone: First, the construction and operation of the new erecting shop; and second, the care which is taken to provide the proper grades of cast iron for the different parts of the locomotive. These will be considered in the order mentioned. The peculiar shape of the erecting shop is shown on the drawing. The sections *A*, *B* and *C* were first erected and have been in use for the past two years. The building is now entirely completed and in full use. Sections *A*, *B* and *C* are reserved for the erecting



General View of Locomotive Erecting Shop.

of very large locomotives, such as those of the Mallet type. Erection is started in bay *C*, and after it has reached a certain point, the locomotive is drawn ahead into section *B* and erection on another one is started in section *C*. The work of finishing the locomotive is done in section *A*, and it is then run out of the shop and is tested on the tracks just outside.

All of the material which is required for erection is brought in from the sides of the shop. The cars containing the material can be shifted in over the standard gage tracks, and the track nearest the wall is used for this purpose only. Each of the transverse sections of the erecting shop is equipped with overhead traveling cranes of suitable capacity, those in the three sections which are used for the larger locomotives being of 75 tons capacity. However, the completed locomotives are not lifted by the cranes, but are moved forward from one section to another during the various stages of erection. Sections *D* and *E*, in the new part of the shop, are devoted entirely to pipe, jacket and lagging work; to the storage of brass fittings, bolts and nuts, and for tool room purposes. Sections *F*, *G* and *H* are used for erecting purposes for a lighter class of locomotives than in sections *A*, *B* and *C*. All of the materials used in sections *F G* and *H* are brought in at the side of the shop, and the locomotives when finished are transferred over one another to the center track of the shop and are taken out through sections *E*, *D*, *C*, *B* and *A*. One half of section *I* is used for flues and flue work and the other half for the assembling of superheaters. Section *J* is used for general repairs and the reconstruction of old locomotives. Section *K* is used for the erection of the largest boilers the different parts of which have been made at Philadelphia and shipped, knocked down, to Eddystone. At the southwestern corner of the building is located a heating plant and coal wharf with hydraulic pressure machinery for boiler riveting. These are not shown on the general drawing.

The building has concrete foundations and concrete walls extending up to the window sills. The frame work is of steel construction and the side walls are of 8 in. hollow tile. A concrete gutter 3 in. thick is used to carry off the drainage between the different sections. The roof construction consists of 10 in. 15 lb. channel purlins, upon which reinforced cement tiles 7/8 in. thick are laid. These tiles are held in place by their own weight and do not require a special fastening, except that a lug on the tile rests against the upper edge of the purlin. The joints between the roof tiles are covered with tile rolls, which fit over projections on the tiles. The floor is made of creosoted wooden blocks laid on a layer of concrete about 6 in. thick. The shop is well lighted.

Four different grades of cast iron are made in the gray iron foundry, the mixtures being varied to suit the different requirements. The building is 200 ft. x 650 ft. and is divided into five sections. One of these is for the making of hollow and steam tight castings, such as steam pipes, etc. This department is equipped with its own core ovens and cupolas, and a grade of iron is used which is low in sulphur. Another section is given over to the molding and casting of ordinary gray iron parts, such as grate bars, cylinder heads, etc., and another to the production of small castings which are made on molding machines. Both of these sections are supplied from the same cupolas. A fourth section of the foundry is devoted to parts whose surfaces are subjected to wear, and this section is also equipped with its own cupola. The fifth division is used for cylinder work and has its own core ovens and cupolas. Each one of these divisions is in charge of a foreman and has its own space for patterns and raw materials. The castings made in the afternoon are sent to the cleaning building during the following night, cleaned, chipped and inspected during the next day. In the afternoon of that day they are loaded, billed out and shipped to Philadelphia. When the records at the shipping room show that an order has been completed, the pattern is ordered returned to the pattern storage building.

The Eddystone plant, in addition to the erecting shop and foundry above mentioned, includes a number of shops and buildings such as the forging shops, pattern shop, pattern storage buildings, power house and pumping stations. The extent of the property is such as to amply provide for future extensions and the railroad facilities are exceptionally good.

CONDUCTING A UNION TICKET OFFICE.*

An Outline of the Organization and Methods Used at St. Louis, Mo., Where Remarkable Results Have Been Obtained.

By B. W. Frauenthal,
General Ticket Agent, Union Station, St. Louis, Mo.

It is the purpose of this paper to discuss a matter that has been the subject of much thought, investigation and discussion within recent years, *i. e.*, large and joint ticket offices, their advantages and disadvantages, and to state what has been done at the St. Louis Union station ticket office, of which the writer has had charge for a number of years.

As is well known, a large part of the traveling public is opposed to joint ticket offices, basing this objection upon the deterioration it is believed the service will gradually experience where competitive methods are eliminated. To my mind this is not a sound objection. There is no reason why proper supervision should not be as effective in a large office as in a number of small ones.

The St. Louis Union station ticket office is situated on the ground floor of the station in the east end of the building, being of easy access from the main and side entrances on Market street and the midway entrance on Eighteenth street. It has a frontage of 25 ft., containing six windows on the general waiting room, and of 70 ft., containing sixteen windows, on the corridor, paralleling the midway adjoining the train shed. For the purpose of organization the force is divided into departments as follows: information bureau, ticket selling, accounting and stock.

BUREAU OF INFORMATION.

The bureau of information is an adjunct of which we have reason to be proud. It was at the St. Louis Union station that it was first given an official status, and from time to time its methods and capacity have been increased, until today it stands as one of the most essential factors in handling the vast throngs passing through the St. Louis gateway. The bureau has two divisions—one handling the six telephones necessary to respond to the constant stream of inquiries being received through that source and wherein at certain hours three men are employed, and the other handling the inquiries at the four windows facing the main waiting room assigned for that purpose. In both divisions a receiving instrument of Gray's telautograph is located, whereon is recorded the arrival and departure of all trains and the placing of outgoing trains under the train shed for the reception of passengers, baggage, mail and express. The transmitting telautograph station is located in the big interlocking tower controlling all train movements in and out of the station, and the information transmitted shows road, train number, time and track. By this means the bureau is kept in perfect touch with the station train movements, and it is given further effectiveness by means of the hourly bulletins that are compiled through the telegraph office covering the time of arrival of all incoming trains, this information being gathered direct from the train despatching office of each line and indicating whether the train is on schedule, and if not, how much late it will arrive.

Under our plan, the prospective purchaser of a ticket is fully equipped at the information bureau with all the necessary information to enable him to transact his business at the ticket sellers' windows with despatch. He is fully advised as to routes, rates, departure of his train, time and track, time of arrival at destination, point of transfer, accommodations on the train, and, in point of fact, there exists no reason for further inquiry when he presents himself at the ticket seller's window. The division handling telephones is isolated from the other parts of the office and does not come in contact with the public by any other means, although fully equipped to do so. Each window displays a conspicuous number, and a careful record is kept of the hours and the identity of the employee by whom it is manned, and it is therefore easy to trace any complaint that may originate relative to incorrect information or any other cause.

A very great number of people present themselves at the information bureau windows to make inquiries on a great diversity of subjects, and there is of necessity cause for celerity in disposing of the inquiries. With this purpose in view, the force is interchangeable; that is to say, the men engaged in selling tickets must be able to cover a window at the bureau and those engaged at the bureau must be competent to handle a window in the selling division. A supervisor is constantly in attendance in charge of both departments and shifts the men as necessity requires. The flexibility of the force under this arrangement proves of great benefit to us at times when one or the other of these divisions becomes congested. I am an enthusiastic believer in the bureau of information in connection with union ticket offices, especially where train movements are to be taken into account.

SELLING DEPARTMENT.

Taking up the selling department, we come again to a class of men who have intimate and sensitive relations with the public because of the financial character of their dealings, and for that reason it is essential that they exercise the utmost tact, courtesy and patience in the performance of their duties. Not only must the seller combine all these requisites, but he must be exceptionally well informed. Each seller constitutes within himself a separate and distinct agent for each of the twenty-two lines we serve, and our service requirements are therefore far more exacting than where but one line is represented. The complications that may surround the sale of tickets are almost without number. Rates fluctuate owing to various causes and the seller must keep himself familiar with each change and all of the numerous special instructions. Then there are the various passenger association rules requiring the closest application.

The matter of rates, however, is the one causing the seller to exercise the utmost precision. The St. Louis Joint Passenger Tariff, which is issued semi-annually or oftener, as may be required, quotes selling fares to interline points and basing fares to many local points which may not be used for selling purposes. When this sheet is received it must be carefully checked, and when the fares quoted therein are in conflict with fares to same point quoted in the various lines' local tariffs, the attention of the interested lines is directed to the fact. Our local tariff, which is compiled in our office, and copy of which is deposited in a convenient place for the use of sellers, contains the rate to some twenty-one thousand towns on the twenty-two lines operating out of this station. It is needless to say that, owing to the many changes in fares, it is necessary to make frequent corrections in the fares quoted in this tariff. The sellers' attention is directed to these changes in a form of notice which is placed on a designated file which every seller is required to examine before going on duty, and he is obliged to indicate his understanding thereof, as well as of all other special instructions, by affixing his signature thereon. Tariffs quoting fares for special occasions, such as summer and winter tourist, convention, homeseeker, colonist rates, etc., are placed in a binder file in such a way that the seller may ascertain rate, route, etc., with very little effort and in little more time than would be required to determine the fare to a local point. The various joint passenger tariffs, quoting fares from other prominent points in the United States and Canada, as well as many foreign lines, local and interdivision tariffs, are filed in a tariff case convenient for sellers' use. This file of tariffs is very complete and there are but few points to which tickets cannot be

*Prepared for the Seventeenth Annual Convention of the International Association of Ticket Agents at Muskoka Lake, Ont., September 9-12, 1912.

sold because of the seller being unable to determine the correct selling fare.

In the selling of tickets ample scope is given each member of the department to exercise his individuality. We are required to render blindfold justice to each interested road. When the prospective purchaser's destination is a competitive point he is required to designate the route over which it is his desire to travel. The seller, where this information has not previously been secured at the information bureau, will name the various routes over which the passenger can travel, or, if it appears desirable, refer the purchaser to the bureau for that information, which, in either event, is furnished with full details pertaining to each route. It will therefore be seen that the exactions of the service require extraordinary talent and that to secure the efficiency necessary to satisfactorily acquit ourselves to the tenant lines there must be a constant and unceasing vigil.

In the selling department we have found it desirable to establish a sub-department for the handling of prepaid orders, ticket deliveries, irregular exchange orders and such other complicated transactions as would put too great a drain on the individual seller's time. Two windows are set aside for this purpose, and we have found that the innovation has been of real value in the handling of the public. The men assigned to this work are highly specialized and have developed peculiar fitness in this particular branch.

ACCOUNTING DEPARTMENT.

In the accounting department our system of auditing is a combination of the most advanced methods in vogue throughout the United States. We have adopted the best features of all the lines with which we deal and so far as we are able have discontinued every method that may attain the result in a more circuitous manner. Our system is a result of the evolution made necessary by the rapid increase of our sales within recent years, which at present approximate $5,000,000 yearly. We have nine desks devoted to this work, apportioned alphabetically among the twenty-two roads. The closing numbers of all tickets are taken daily at midnight, except Sunday. I believe we are performing a check that is infrequent at a great many offices, since we include all coupon as well as local ticket numbers. A daily register is compiled from this check of all local and coupon tickets on sale and it is therefore impossible for a ticket to remain unaccounted for to exceed twenty-four hours. Each seller compiles a report at the end of his day's work of the sales accredited to each line and deposits it on the corresponding desk, enclosing therewith the auditing stubs, exchange orders, authorities, etc. The accountant checks the rate against the stubs and other data and then makes a complete report to each line covering the entire day's sales, carrying the general totals to the chief accountant's desk, where a summary of ticket sales is made and compared with the cash remitted by each seller, whereby the general daily balance of the office is determined.

The relation between the selling and accounting departments, it will be seen, is similar to that on any railroad between its auditor and its various agents. The accounting department treats each seller as a road's auditor would its agent and in checking rates or the proper form of tickets makes such corrections as may be necessary and advises the seller of such action on a prescribed form showing the amount of debit or credit for which the correction calls. A seller receiving notice of such correction is required to acknowledge it by his countersignature and then return it to the agent's desk. In this way a careful check is kept on the performance of each seller and the character of the errors with which he may be charged. In addition to these notices of corrections there is posted daily for the general inspection and information of the force an epitome of ticket sales, cash accounts and credits and debits which serves the purpose of keeping each seller acquainted with his standing with the office in this respect. Remittances are made four times each month to the various lines covering their receipts and such reports as may be required consistent with the general conduct of the office along lines of economical efficiency.

STOCK DEPARTMENT.

In the stock department are required rare judgment and extraordinary care. There are carried in our cases over 2,000 forms of local tickets and over 8,000 coupon forms, a grand total of 10,000 varieties of tickets ranging in size from a street car transfer to coupons with a maximum length of 8 ft. As the stock is received from the various lines, it is counted and compared with the invoices. Card tickets are furnished in numerical order to follow the closing numbers of stock on hand. Coupon tickets, however, come in broken numbered lots. With the acknowledgment of receipt to the general passenger agent furnishing them, the commencing and closing numbers are registered in the stock book, which is changed with the receipt of each consignment. A check is made monthly with the stock on hand as shown against that reported in the stock book, with a view of locating any unreported sales. The reserve stock is kept in cabinets containing drawers of convenient size, from which the selling cases are supplied in consecutive numbers. Card tickets are placed in the selling cases according to the rate and coupon tickets according to the alphabetical initial of the last line that delivered a passenger at the point of destination. To maintain the proper supply of these multitudinous tickets is a task of no small size and requires an application second to no other duty in the office. To assist the stock clerk in maintaining an adequate supply we have devised what we term an "alarm ticket." This consists of a bright red-colored card indicating the form and corresponding to the size of the ticket, which is placed in the selling cases of card tickets and on the hooks carrying the coupon active stock. When the stock is depleted to a point requiring replenishment this colored card is uncovered by the sale of all tickets deposited in its advance, and is removed by the seller and placed in a designated receptacle where the stock clerk is automatically informed of what supply in the selling cases needs attention.

The conditions, as will readily be perceived, while individually simple, are complicated by the many different lines and their various requirements, the simple rules governing any transaction becoming through various interpretations a complex system. Yet, withal, we have contrived to build up an organization that is a source of no little personal pride to myself and which I am not hesitant in saying is second to no other in the United States or Canada. Not only have we conducted our affairs in a manner satisfactory to the Terminal Railroad Association, but we have received the approval repeatedly of the auditing committees of the various tenant lines, and we have never had the suspicion of a defalcation.

HANDLING OF UNION TICKET OFFICES.

Returning to the first phase of my remarks, I am impelled to observe that there is nothing impossible or impracticable in the plan of the union ticket office. It requires only the same desire to render the best possible service in acquittal with the company or organization with which the individual takes service. The successful ticket seller should bear in mind that all the expense to which a road has subjected itself through perfecting its service and bringing that perfection before the public in seeking its patronage may be nullified by carelessness, indifference or incompetence, and that the first impression a traveler may receive, and which frequently is the lasting one, comes through the manner in which he is treated at the ticket window. It therefore behooves him to exercise all the diplomacy of which he is capable. There must be no air of condescension or superiority, but, on the contrary, that attitude of deference to the purchaser's wishes that has won such pronounced success in the commercial world wherein it is rigorously enforced. There is no more reason why courtesy in all of its forms should not exist in such an office than in any number of offices of individual lines. The success of the union ticket offices requires only discrimination in selecting the personnel and the exaction of such service as is necessary for its proper conduct; and supervision and intelligent and constant effort will accomplish this result. We have accomplished it in the city of St. Louis, and it can and will be accomplished elsewhere.

General News.

The Southern Pacific is being prosecuted by the government in the federal court at San Francisco on 31 charges of violation of the law regulating the length of time which animals may be kept in cars without food or water.

At the Pennsylvania station, Pittsburgh, Pa., the charge for storage of parcels for the second and subsequent periods of 24 hours has been reduced from ten cents to five, the price for the first day remaining at ten cents.

On November 1, the new union station at Joliet, Ill., occupied by the Chicago & Alton, the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, and the Michigan Central, was opened to the general public. Since that date all passenger trains arrive at and depart from the union station instead of from the old station.

The officers of the Chicago & North Western entertained a party of newspaper men and editors of railway papers on November 1 on a trip of inspection of its recently completed new freight terminal facilities near Chicago, including an extensive addition to the yard capacity at Proviso, Ill., comprising 56.16 miles of track with a capacity of 6,000 cars, and the Desplaines Valley Railway, a new belt line 22 miles long, extending about the city to the west and north and connecting the three main line divisions. By this belt freight is taken around Chicago outside of the congested district.

The following designations for the various divisions of the Seaboard Air Line will be effective November 10: The present First division will be known as Virginia division; the Second division as the North Carolina division; the Third division as the Georgia division; the line from Columbia, S. C., to Jacksonville, Fla., and from Jacksonville, to River Junction, Fla., including branches, will be known as the South Carolina division; from Savannah, Ga., to Montgomery, Ala., including branches, as the Alabama division, and from Fernandina, Fla., to Tampa, including branches, as the Florida division.

Difficulties of Discipline.

The result of the first year's operation of the safety committee on the Chicago & North Western, as reported by Mr. Richards was to decrease the personal injuries and deaths by 18 per cent., the money saving alone amounting to about half a million dollars. When all is said and done, however, it has to be admitted that the "Safety First" movement is directed mainly to lessening the casualties among employees; and that it is not likely to reach some of the weightier matters of track, equipment and discipline. . . . It has lately become familiar talk among the railroad men of the Boston region that one of the New England roads not long ago had seventeen enginemen known to be guilty of running past signals set against them. They were not disciplined, for the alleged reason that to administer effective and merited discipline to seventeen engineers at once would embarrass the company in the operation of its trains. And the whole matter slid off with an intimation to the officers of the engineers' brotherhood locals that if any more engineers were caught passing signals and caught one at a time instead of in these inconveniently large bunches, something would have to be done about it.

Discipline in the case of the engineman who disregards signals seems to be a matter of considerable difficulty. The unwholesome condition now existing is sharply stated in a recent editorial in the *Railway Age Gazette,* which calls attention to what it declares to be unfair and misleading reports on accidents made by United States inspectors.

This editorial brings us face to face with the antagonism between the present position and power of the railroad labor organizations and the interest and welfare of the public. The public itself is in large part to blame for the present unhealthy state of affairs, because in any issue between the unions and the railroads the public has seen little more than the issue of higher wages and shorter hours, on which it has been instinctively inclined to the side of the men, and against the railroads. It has lost sight of the fact that the railroad unions, like all other labor unions, will, if possible, force the employer to treat the fit and unfit alike. In many ways the unions stand more or less seriously in the way of the firm and prompt discipline which is absolutely essential to the safety of the traveling public. . . . Almost any railroad management would only be too glad to enforce effective discipline if it could be assured of support from the public, which has hitherto allowed the unions to seize the balance of power.

The "safety first" movement, while of great value to some roads, holds forth no promise of solving the most serious problems of discipline in which the public has the largest immediate stake.—*Benjamin Baker, in Boston Transcript.*

Common Drinking Cups Prohibited.

The order of the Secretary of the Treasury, requiring interstate carriers, by rail or water, to abolish common drinking cups, briefly noticed last week, page 849, is in full as follows:

"On account of the frequent spread of disease by the use of common drinking cups, the following amendment is hereby made to the Interstate Quarantine Regulations promulgated by this department September 27, 1894, and amended August 17, 1905, June 24, 1909, and May 15, 1912, said amendment and regulations being in accordance with section 3, act of Congress approved February 15, 1893.

"Article 3, General Regulations, is hereby amended by the addition of the following paragraph:

"Paragraph 13. Common carriers shall not provide in cars vehicles, vessels or conveyances operated in interstate traffic, or in depots, waiting rooms or other places used by passengers traveling from one state or territory or the District of Columbia to another state or territory or the District of Columbia, any drinking cup, glass or vessel for common use; provided that this regulation shall not be held to preclude the use of drinking cups, glasses, or vessels which are thoroughly cleansed by washing in boiling water after use by each individual, nor shall it be held to preclude the use of sanitary devices for individual use only."

The states which have by direct statute prohibited the use of common drinking cups are Colorado, Connecticut, Illinois, Indiana, Massachusetts, Maryland, New Hampshire, New Jersey and Kentucky. Prohibitory or regulative orders issued by state health boards are in force in Idaho, Iowa, Kansas, Louisiana, Michigan, Mississippi, Missouri, Montana, Oklahoma, Oregon, South Carolina, South Dakota, Texas, Utah, Vermont, Washington and Wisconsin.

Public Health, bulletin No. 57, issued by the Treasury Department, gives information about state laws and also about the physicians' investigations concerning cups, towels and other things.

Strike of Canadian Pacific Clerks.

The Canadian Brotherhood of Railroad Employees, claiming to represent 5,000 men on the Canadian Pacific, has for some time been threatening a strike on that road, and on Wednesday of this week reports from Winnipeg said that 1,500 of these men, mostly clerks in the freight department, had left their work. They had demanded a large increase of pay. Officers of the road said that the places of the strikers would be filled without much delay. The government minister of labor refused to appoint a board of conciliation, and the railway company not only refused to deal with the representatives of the brotherhood, but announced that it would not nominate a member of the proposed conciliation board. Giving its reasons for its position, the railway company said: "We cannot permit any employees engaged in confidential positions or who have access to the company's correspondence to be a member of any organization, as such would be contrary to the interests of the company. If the employees were permitted to join an organization such as this the records of the company would be confidential no longer. The company from time to time has granted and quite recently granted substantial increases to the above-mentioned class of employees."

American Society of Mechanical Engineers.

The annual meeting of the American Society of Mechanical Engineers will be held in New York, December 3-6. Among the papers to be presented are the following: Increase of Bore of High-Speed Wheels by Centrifugal Stresses, by Sanford A. Moss; Measurement of Air in Fan Work, by Charles H. Treat; The Vauclain Drill, by A. C. Vauclain and Henry V. Wille; Tests of a 1,000 H. P. 24 Tubes High, B. & W. Boiler, by B. N.

Bump; The V-Notch Weir Method of Measurement, by D. Robert Yarnall; Dimensions of Boiler Chimneys for Crude Oil, by C. R. Weymouth; Air in Surface Condensation, by George A. Orrok; The Centrifugal Blower for High Pressures, by Henry F. Schmidt. One of the reports will be prepared by the Power Tests Committee, and will supersede the earlier reports upon methods for conducting trials for pumping engines, locomotives, steam boilers, and steam engines, besides taking up the testing of other apparatus, such as gas and oil engines, water wheels and compressors, blowers and fans. The general arrangement of the sessions will be substantially as follow: On December 3 there will be the president's address, followed by the reception to the president-elect and the retiring president, Dr. Alex. C. Humphreys; on December 4 there will be a business meeting followed by simultaneous sessions under the direction of the sub-committees on Machine Shop Practice and Textiles; on the same day there will be reports of committees on Power Tests, on Symbols, etc., and also a dinner to Professor John E. Sweet, honorary member and past president; on December 5 there will be simultaneous sessions under the direction of the sub-committees on Railroads, Iron and Steel, and Cement Manufacture. In the afternoon of the same day there will be sessions on the Power Plant and on Hydraulic and Pneumatic Apparatus, including centrifugal pumps, blowers and the measurement of flow of fluids, to be followed by a dance in the evening. On December 6 there will be a session of the sub-committee on Administration.

Plans for the meeting of the American Society of Mechanical Engineers with the Vereins Deutscher Ingenieure include an extensive tour of the industries in Germany. The party will arrive at Leipzig on June 22. At the opening session on June 23 there will be a welcome by the king of Saxony and the municipal authorities of Leipzig, and two addresses, one by a representative of the German and the other by a representative of the American society, which will be on general subjects. The session on June 24 will be largely devoted to technical papers, and on the following day the party will leave for a tour of industrial Germany, visiting many important cities, including Dresden, Berlin, Dusseldorf, Cologne, Frankfurt, Nuremberg, Munich, etc. A trip up the Rhine from Bonn to Rudesheim will be made by boat. At Rudesheim there will be a festival on the embankment. The final meeting will be held in Munich, July 7, in connection with the Museum of Technical Arts.

American Association of Freight Traffic Officers.

The speakers at the annual dinner of the American Association of Freight Traffic Officers, to be held at the La Salle Hotel, Chicago, November 15, will include William Ellis, W. H. Manes, J. A. Munroe (U. P.), W. L. Ross (T. St. L. & W.), and W. D. Nesbit. George A. Blair (C. & O.) will be toastmaster.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Convention, May 6-9, St. Louis, Mo.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Friday of March and September.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN ELECTRICAL RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York; semi-annual, November 20, 1912, Chicago.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-23, 1913, Montreal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Convention, March 18-20, 1913, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—M. H. Bray, N. Y. N. H. & H., New Haven, Conn.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.; annual, June, 1913.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Convention, 3d week in January, 1913, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago; annual, May 20, 1913, St. Louis, Mo.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Meeting Dec. 10-11, 1912, New Orleans, La.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, Brown Marx building, Birmingham, Ala.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.

MAINTENANCE OF WAY MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa. Convention, November 19-21, Chicago.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Convention, May 26-29, 1913, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass.

NATIONAL RAILWAY APPLIANCES ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Tuesday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York; annual, November 19, 1912, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MAUNFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo. Next meeting, Nov. 17, 1912, Cincinnati, Ohio.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

RAILWAY TEL. AND TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Convention, September 9-11, 1913, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.

UTAH SOCIETY OF ENGINEERS.—R. B. Ketchum, University of Utah, Salt Lake City, Utah; 3d Friday of each month, except July and August.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The Baltimore & Ohio has opened a new freight pier in New York City. It is at the foot of Dover street, East River, pier 21.

B. A. Worthington, president of the Chicago & Alton, will give an address at the monthly luncheon of the Traffic Club at Chicago on November 14.

On October 26, the Missouri Pacific-Iron Mountain system moved 14,852 carloads of freight, a new record for the system. The previous record was made on October 6, when 14,649 carloads were moved.

The Michigan railways have filed with the Michigan railway commission a revised schedule of class rates for state freight traffic on a mileage basis. The commission's rate expert has estimated that the new rates effect an advance of 3.38 per cent. over the present rates.

The Canadian Pacific, for the purpose of handling large shipments of grain through the American ports in bond, has filed a new tariff of rates on grain from western Canada points to Duluth and Minneapolis, in which the rates are placed on a parity with those to Fort William.

The Pennsylvania Company is this week running, in cooperation with the Ohio State University, a farmer's instruction train over the Toledo and Akron divisions of the road. The schedule of the train calls for stops at 49 places. There has been added to the train a car in which will be given agricultural lectures made simple for school children.

Records are made in every line of endeavor nowadays. The Interstate Commerce Commission has received what is called the record complaint. Business men of Montana demanding a reduction of rates on 76 railways and also asking for the sum of $500,000, alleged to have been already collected on bills that are too high, present a document bearing 1,562 signatures.

On November 3, the Chicago, Burlington & Quincy put into effect a new winter time-table between Chicago and Denver. The Denver Limited, leaving Chicago at 5 p. m., will arrive at Denver at 8:30 p. m. the next day, instead of 7:30 p. m. The Colorado Limited leaving Chicago at 9:45 a. m., will arrive at Denver at 1:15 p. m., instead of 1 p. m. Eastbound schedules were also lengthened slightly.

The Chicago & Alton, in connection with the St. Louis, Iron Mountain & Southern, the Texas & Pacific, and the International & Great Northern, has put on through sleeping cars between Chicago and San Antonio, Tex., leaving Chicago at 11:43 p. m. daily, and arriving at San Antonio at 6:30 p. m. the third day. Returning, the cars leave San Antonio at 2 p. m., arriving at Chicago at 7:55 a. m. the third day.

On December 10, the car ferry of the Ann Arbor between Frankfort, Mich., and Menominee, Mich. will be closed for the winter season. It is expected to resume operation about April 1. During the period this route is closed traffic to and from Menominee, Mich., and Marinette, Wis., will be handled via Manitowoc, Wis., or Kewaunee, Wis. The car ferries to Manitowoc and Kewaunee, Wis., and Manistique, Mich., run throughout the year.

The annual election of officers of the Traffic Club of St. Louis will be held at a smoker on or about November 11. The nominating committee has submitted two tickets of officers called the "Gingers" and the "Peppers." Both are headed by the name of Clarence H. Howard, president of the Commonwealth Steel Company, as candidate for president, and both contain the name of A. F. Versen, assistant traffic commissioner of the Business Men's League of St. Louis, as a candidate for re-election as secretary and treasurer. There are five candidates for vice-president on each ticket.

Following the notice about freight car shortage issued by the Interstate Commerce Commission last week, and reprinted in another column of this issue, the commission announces that the Chesapeake & Ohio has discontinued for one week the embargo heretofore maintained by it upon the loading of coal cars for points beyond Toledo. The commission is advised that the Michigan connections of the Chesapeake & Ohio are returning its coal cars freely, thus enabling it to discontinue the embargo for the present; and "it is hoped that the free return movement of empty coal cars will continue and thus make the relief above noted permanent.

Commissioner Lane on Car Shortage.

The Interstate Commerce Commission has issued a circular to the railroads and prominent shippers reading in part as follows:

"From all parts of the country reports are brought to us indicating that there has already begun a car shortage which promises to be more serious. It would be difficult to estimate the financial loss to the industries and commerce of this country should such a condition obtain for any length of time. . . . Especially is there danger of distress arising out of an insufficient coal supply. The commission is receiving daily advices from industries, state institutions, coal merchants and private individuals that unless relief is had immediately great suffering will ensue. It appears that many roads are unable to secure their coal cars from connecting lines, the cars having been appropriated by those lines and put to other uses. One railroad reports that out of 30,000 coal cars owned it now has but 2,800 available on its line and has been forced to place an embargo against coal going off its line in its cars. The per diem charge seems inadequate to secure return of cars. . . . Such procedure on the part of railroads is nothing less than theft. The rules when carried out in good faith provide for returning cars promptly to the home line. Departure from these rules is an appropriation of property which is morally unjustifiable.

"Such an embargo is unlawful, as this commission held in the case of the Missouri & Illinois Coal Co. v. Illinois Central, 22 I. C. C., Rep. 39. (*Railway Age Gazette*, December 15, 1911, page 1252.)

"The power of the commission is limited to the promulgation of rules which will insure fair play between the carriers and make possible adequate service to the shippers. The duty of framing such rules rests primarily upon the carriers themselves, and the commission has said that unless such rules were made it would itself undertake the task. Such remedy, however, would be entirely inadequate to the imperative needs of the present situation, and in view of the condition which obtains we deem it to the public interest to make the following suggestions to the railroads of the country: (1) That a higher per diem rate shall be made to apply for the use of cars as between the carriers. (2) That an inspection service be at once instituted which shall report to this commission violations of the rules intended to insure the return of cars. (3) That operating officials be instructed to make fuller use of locomotives and cars by increasing the speed of freight trains. An average movement of less than 25 miles per car per day is not adequate to the need of times such as this.

"These suggestions are made in the hope that the carriers will at once so co-operate as to bring about a change in conditions. . . . We fully appreciate that at a time of phenomenal crops the carriers may not be reasonably called upon to have a car supply equal each day to the day's needs; but in an honest effort to reasonably meet the burden of their obligation it now devolves upon the railroads to make superlative efforts to secure the fullest use of equipment. The burden of being unable to meet their public duty should be cast by the carriers upon those railroads which have failed to secure their adequate and proportionate quota of the country's car equipment. We are authoritatively advised that it has been the policy of some carriers to rely on the equipment of their connections, and that the present embarrassment both of the railroads which have not been equally foresighted or which have pursued a policy of "renting" rather than buying cars, is the chief cause of present conditions. Inasmuch as carriers have not been able to devise for themselves methods by which they can secure honorable treatment from their connecting roads, the duty devolves upon all carriers to adopt methods which will give relief to the public.

"In a situation such as the one now existing the commission feels justified in urging upon shippers that they shall not avail

themselves of the full limit of time allowed, but will do their utmost to release equipment as promptly as is possible. Should it appear that cars are being held by shippers at this time for storage purposes we shall give consideration to the issuance of a general rule which will temporarily apply a higher rate of demurrage than is now imposed."

On Monday of this week the commisison received a complaint against certain railroads by telegraph, and at once set about settling it by telegraph. A telegram was received from the Minnesota Potato Growers and Shippers' Association saying that certain roads are refusing to give the potato shippers sufficient refrigerator cars, and that they are "exposed to danger of loss." The commission immediately wired the railroads, the Great Northern, the Northern Pacific, the Minneapolis, St. Paul & Sault Ste. Marie, and the Chicago & North Western. In every instance the railroads telegraphed back that they are willing to do all in their power to relieve the congestion of potato shipments, but calling attention to the fact that the potato crop this year is one of the largest known; and besides the roads are pushed to furnish cars with which to move the enormous wheat crop.

Car Surpluses and Shortages.

Arthur Hale, chairman of the Committee on Relations Between Railroads of the American Railway Association, in presenting statistical bulletin No. 129-A, giving a summary of car surpluses and shortages by groups from July 5, 1911, to October 24, 1912, says: The total surplus on October 24, 1912, was 17,289 cars; on October 10, 1912, 22,810; and on October 25, 1911, 39,306 cars. Compared with the preceding period; there is a decrease in the total surplus of 5,521 cars, of which 2,522 is in box, 1,368 in coal, 1,749 in miscellaneous, and an increase of 118 in flat car surplus. The decrease in box car surplus is in groups 2 (New York, New Jersey, Delaware, Maryland and eastern Pennsylvania); 6 (Iowa, Illinois, Wisconsin and Minnesota); 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas); 9 (Texas, Louisiana and New Mexico), and 10 (Washington, Oregon, Idaho, California, Nevada and Arizona). The increase in flat car surplus is in groups 2, 6 (as above), 7 (Montana, Wyoming, Nebraska and the Dakotas); 8 and 10 (as above). The decrease in coal car surplus prevails throughout the country, excepting in group 9 (as above). The decrease in miscellaneous car surplus appears in groups 2 (as above); 4 (the Virginias and Carolinas); 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida); 6, 7, 8 and 10 (as above).

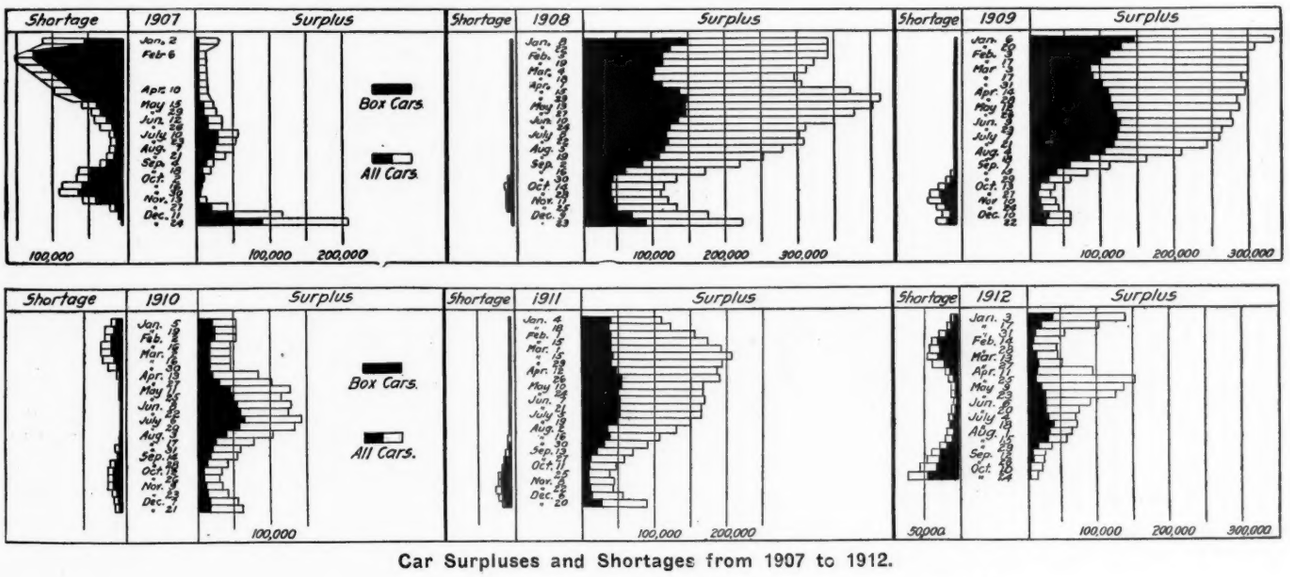
The total shortage on October 24, 1912, was 67,270 cars; on October 10, 1912, 54,389; and on October 25, 1911, 18,774 cars. Compared with the preceding period; there is an increase in the total shortage of 12,881 cars, of which 7,607 is in box, 958 in flat, 3,479 in coal and 837 in miscellaneous. The increase in box car shortage prevails throughout the country, excepting in groups 4, 7 and 9 (as above). The increase in flat car shortage is in groups 3 (Ohio, Indiana, Michigan and western Pennsylvania); 4, 5, 6, 8, 9 and 10 (as above). The increase in coal car shortage is in groups 2, 3, 5, 6 and 9 (as above). The increase in miscellaneous car shortage is most apparent in groups 2, 3, 6, 10 (as above), and 11 (Canadian lines).

Compared with the same date of 1911; there is a decrease in the total surplus of 22,017 cars, of which 4,987 is in box, 2,664 in flat, 7,025 in coal and 7,341 in miscellaneous. There is an increase in the total shortage of 48,496 cars, of which 25,413

CAR SURPLUSES AND SHORTAGES.

Date.	No. of roads.	Surpluses Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—October 24, 1912	7	0	14	0	112	126	1,431	309	618	6	2,364
" 2.— " 24, 1912	26	192	44	1,265	261	1,762	3,177	44	5,101	462	8,784
" 3.— " 24, 1912	28	0	94	0	721	815	5,813	353	4,190	519	10,875
" 4.— " 24, 1912	10	0	56	463	525	1,044	3,603	888	3,059	512	8,062
" 5.— " 24, 1912	21	10	0	150	463	623	4,498	1,397	2,432	88	8,415
" 6.— " 24, 1912	25	1,517	132	1,205	1,852	4,706	4,815	696	1,738	880	8,129
" 7.— " 24, 1912	3	0	72	0	347	419	839	0	115	0	954
" 8.— " 24, 1912	17	11	50	405	1,017	1,483	5,623	472	566	303	6,964
" 9.— " 24, 1912	12	265	42	319	360	986	1,870	286	551	200	2,907
" 10.— " 24, 1912	22	178	642	1,316	2,689	4,825	5,238	281	6	216	5,741
" 11.— " 24, 1912	7	6	51	0	443	500	3,449	308	0	318	4,075
Total, October 24, 1912	178	2,179	1,197	5,123	8,790	17,289	40,356	5,034	18,376	3,504	67,270
" October 25, 1911	161	7,166	3,861	12,148	16,131	39,306	14,943	896	2,278	657	18,774
" October 26, 1910	152	8,257	2,024	5,778	13,072	29,131	12,898	1,596	5,325	2,077	21,896
" October 27, 1909	174	13,029	3,090	5,287	9,490	30,896	23,138	1,412	8,743	3,343	36,636
" October 28, 1908	158	39,383	10,185	31,541	29,803	110,912	8,175	167	2,261	236	10,839
" October 30, 1907	161	786	600	1,285	1,275	3,946	61,592	3,546	15,987	9,622	90,757

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines· Group 11—Canadian lines.



Car Surpluses and Shortages from 1907 to 1912.

is in box, 4,138 in flat, 16,098 in coal and 2,847 in miscellaneous cars.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report, and totals for the country for corresponding dates in previous years. The diagram shows total bi-weekly surpluses and shortages from 1907 to 1912.

INTERSTATE COMMERCE COMMISSION.

The commission has suspended from November 12, 1912, to March 12, 1913, certain items in supplement 18 to the Illinois Central tariff supplement, which advance rates on lumber from points in Louisiana and Mississippi to Memphis, Tenn. The advances which have been suspended range from one-half cent to 2¼ cents per 100 lbs.

Examiner Ward Prouty conducted a series of hearings in the general investigation by the commission of practices in connection with the weighing of freight at Seattle on October 21, at Portland on October 23, and at Salt Lake City on October 28 and 29. The examination of witnesses was conducted by J. T. Marchand, representing the commission.

The commission has suspended from November 4, until March 4, items in the supplement to the tariff of the Missouri Pacific which advance class and commodity rates between certain stations in Missouri, Kansas and Nebraska. The rates in question apply from Topeka, Kan., and certain other stations to destinations in Kansas and Nebraska, the route to the destinations in Kansas being through a portion of the state of Missouri, and therefore interstate.

Complaint Dismissed.

Virginia-Carolina Chemical Company v. Southern Railway Company. Opinion by the commission:

The commission found that the rates charged for the transportation of fertilizer from Blacksburg, S. C., to various local stations in North Carolina were neither unreasonable nor otherwise unlawful. (Unreported opinion No. 680.)

Nevada Hills Mining Company v. Southern Pacific. Opinion by the commission:

The rates for the transportation of mining machinery, structural iron, and supplies from San Francisco, Cal., to Fallon, Nev., were assailed as unjust and unreasonable. The commission found that no reparation should be awarded and that after certain overcharges had been refunded the complaint should be dismissed. (Unreported opinion No. 681.)

Squire Dingee Company v. Chicago, Indianapolis & Louisville, et al. Opinion by the commission:

On a shipment of pickles from Chicago to Atlanta, Ga., the complainant was charged a rate made of the proportional commodity rate of 12 cents to Cincinnati and the sixth class rate of 41 cents beyond. The complainant contends that the proportional rate of 12 cents to Cincinnati was unreasonable. The commission found that the evidence was not conclusive. (Unreported opinion No. 674.)

Dickhaus, Momberg & Company v. Pittsburgh, Cincinnati, Chicago & St. Louis et al. Opinion by the commission:

A car partially loaded with potatoes was shipped from Mansura, La., and stopped in transit at Willow Glen, La., to complete loading. Thence it moved to Cincinnati, Ohio. There was a joint rate from Mansura to Cincinnati, but the tariff did not provide for stoppage to complete loading. A combination of intermediate rates and a stop-off fee of $5 was applied. The complainant contends that the rate charged was unreasonable and seeks reparation. The commission found that the rates were reasonable in themselves and properly assessed with the exception of the stop-off fee of $5, which the defendant was ordered to refund. (Unreported opinion No. 675.)

Reparation Awarded.

Lee A. Nauss v. Chicago & Eastern Illinois et al. Opinion by the commission:

The rate of 10 cents per 100 lbs. on logs from Shelburn and Farmersburg, Ind., to Greenville, Ohio, was not found unreasonable, but reparation was awarded on misrouted shipments. (Unreported opinion No. 678.)

Timmons Harmount v. Louisville & Nashville et al. Opinion by the commission:

The rate on crossties from Calvary, Ky., to Cincinnati, Ohio, was found unreasonable to the extent that it exceeds the rate for similar transportation of lumber of the kind of wood from which the ties are made. (Unreported opinion No. 679.)

Headington & Hedenbergh v. St. Louis Southwestern et al. Opinion by the commission:

The commission found that the refrigeration rate of 32½ cents on peaches from Bullard, Tex., to Alton, Ireton, Linne Grove, and Paulina, Iowa, was unreasonable to the extend that it exceeds 30 cents and prescribed the latter rate for the future. (Unreported opinion No. 682.)

Charles F. Frey v. Oregon-Washington Railroad & Navigation Company et al. Opinion by the commission:

The commission found that the carload rate on four horses with man in charge from Gillespie, Ill., to Portland, Ore., was unreasonable, to the extent that it exceeded the less-than-carload rate on the live stock plus the fare of the caretaker. (Unreported opinion No. 677.)

Wilson Brothers v. Delaware, Lackawanna & Western. Opinion by the commission:

The complainant leased from the defendant a warehouse with a platform extending to a terminal delivery track that serves complainant and other shippers and receivers. The defendant's tariff provided that track-storage charges should apply "upon carload freight for delivery from cars direct to drays." The complainant's freight is delivered upon a platform of the leased warehouse and not to drays. The complainant contended that the track storage charges were assessed without the tariff authority and were therefore, unreasonable. Reparation was asked. The commission found that the assessment of track-storage charges against complainant under the circumstances was not in accordance with the published tariff, and was therefore illegal. Reparation awarded. (25 I. C. C., 11.)

Hop Rates Increased.

In the matter of hop rates. Opinion by Chairman Prouty:

The carriers have convinced the commission that $1.75 per 100 lbs. in carloads, with a minimum of 15,000 lbs., and $2.25 per 100 lbs. in less than carloads, as blanket rates for the transportation of hops from points of production in Washington and Oregon to destinations upon the Missouri river and east, are reasonable. The order of suspension was vacated. (25 I. C. C., 16.)

Coal Rates Not Advanced.

In re investigation and suspension of advances in rates by carriers for the transportation of coal in carloads from Galveston, Tex., to points in Louisiana. Opinion by Commissioner Lane:

The commission found that the carriers had ample opportunity to present testimony establishing the reasonableness of the proposed advances in rates, but failed to offer evidence. It therefore ruled that the proposed advances were unreasonable and unjust, and that the items advancing the rates on coal between the points named should be canceled. (Unreported opinion No. 673.)

Relations Between New York Central Lines and O'Gara Coal Company.

The relations between the New York Central Lines and the O'Gara Coal Company and other coal mines along the line of the Cleveland, Cincinnati, Chicago & St. Louis, in Illinois, were made the subject of a supplemental hearing conducted by Commissioner Harlan at Chicago on October 31 and November 1. The hearing was a part of the general investigation undertaken by the commission three years ago under the Tillman-Gillespie resolution, during which it was shown that a number of officers of New York Central Lines held stock and bonds in the O'Gara Company.

R. M. Huddleston, general auditor of the New York Central

Lines, was questioned at considerable length regarding payments to coal companies for coal in advance of its receipt, and particularly regarding the disposition of money represented by seven vouchers aggregating $60,000, paid to the O'Gara Coal Company, which an examination of the books by an examiner for the commission had not satisfactorily explained. Mr. Huddleston explained that the seven vouchers represented payments for coal received during the construction of the Chicago, Indiana & Southern, and the rebuilding of a portion of the Big Four in 1905 and 1906, and that the accounts had become confused because the coal was taken at any point where it was needed for company fuel use. He mentioned 300 cars of coal as having been "lost" and paid for, whereupon counsel for the commission asserted that this would only account for about $25,000. Mr. Huddleston was directed to return the next day with papers accounting for the payment. On Friday morning his chief clerk stated that he was under a doctor's care and unable to appear. Carbon copies of the invoices purporting to represent the payment of the $60,000 were produced which counsel for the commission contended represented payments for a larger sum and had been altered to make a total of exactly $60,000. On account of Mr. Huddleston's absence the hearing was adjourned to a later date.

E. T. Glennon, assistant vice-president New York Central Lines, testified that he owned stock in the O'Gara Company, and that he at one time owned some of the bonds of the company, which he had disposed of. Dr. F. E. Pierce, surgeon for the Lake Shore & Michigan Southern, also admitted that he owned stock in the Saline County Coal Company, which he said he had inherited.

Coal Rates Reduced.

Marion Coal Company v. Delaware, Lackawanna & Western. Opinion by Commissioner Meyer:

The defendant's rate per long ton on anthracite coal in carloads from Taylor, Pa., to Hoboken, N. J., or New York Lighterage station, N. J., f. o. b. vessel, of $1.13 on rice and smaller sizes found excessive and unreasonable to the extent that it exceeds 98 cents per long ton. (25 I. C. C., 14.)

Tap-Line Case.

In re investigation and suspension of schedules canceling through rates with certain tap-line connections; and certain other cases consolidated herewith.

The commission modified its order in the tap-line case to read substantially as follows:

The track and equipment of a number of specified tap-lines with respect to the industry of the several proprietary companies are plant facilities and the service performed therewith for the respective proprietary lumber companies in moving logs to their respective mills and the products of the mills to the trunk lines is not a service of transportation by a common carrier railroad, but is a plant service by a plant facility; and any allowances or divisions of the rate on account thereof are unlawful and result in undue discrimination.

The principal defendants are ordered to abstain from making any such allowances to any of the specified parties in respect of any such above-described service.

The petitions of certain tap-lines asking for the re-establishment of through routes and joint rates to interstate destinations are dismissed, so far as they relate to rates on the products of the mills of the respective proprietary companies.

The principal defendants are ordered to re-establish with certain specified parties the through interstate routes and joint rates in effect on April 30, 1912, but the rates on yellow pine lumber, and articles taking the same rates, from points on the lines of certain specified parties shall not exceed the current rates in effect from the junction points, and the allowances or divisions out of these joint rates, to be paid by the principal defendants to the specified parties on the products of the mills of the respective proprietary companies, shall not exceed the divisions or allowances specified in the supplemental report of the commission, which are hereby fixed as maximum divisions or allowances thereon.

The principal defendants shall also re-establish through routes and joint rates with certain other specified parties, who have not filed petitions asking for such through routes and joint rates, and these routes and rates shall be subject to the terms and conditions prescribed for the establishment of the other through routes and joint rates with the other specified parties.

The principal defendants are ordered to re-establish the through routes and joint rates in effect April 30, 1912, on traffic other than the products of the mills of the respective proprietary companies in the case of any of the parties to which the re-establishment of through routes and joint rates on the products of the mills of the respective proprietary companies were refused.

The divisions of all joint rates herein required and authorized to be re-established on traffic other than the products of the mills of the several proprietary lumber companies shall be submitted to the commission for approval.

In the case of certain specified parties no allowances or dividends shall be made on the products of the mills of the respective proprietary lumber companies.

Investigation and suspension No. 11.

STATE COMMISSIONS.

A. Huppuch has resigned as a member of the New York Public Service Commission, Second district, and Gov. Dix has appointed former state senator Curtis N. Douglas of Albany to fill the vacancy. The resignation and appointment are to take effect November 15.

The California railroad commission has issued an order requiring the railways to file copies of all their time tables with the commission, and to post notices of changes in the arrival and departure of regular passenger trains. The order is effective November 11.

The Missouri railroad and warehouse commission will hold a hearing at Kansas City, Mo., on November 22, on a complaint of the Monarch Vinegar Works against the Chicago, Burlington & Quincy and four other railways, alleging discrimination in the rates on cull and windfall apples against the complainant and in favor of manufacturers at competing points.

COURT NEWS.

The Federal grand jury at Omaha, Neb., has returned indictments against the Missouri Pacific, the Chicago, Rock Island & Pacific, the Chicago, Burlington & Quincy and the Wabash on charges of violation of the law by applying less than the legally published rates on shipments of alfalfa meal. The charges appear to be based on a question of technical interpretation of a tariff. The tariff provides that alfalfa meal shall take the corn rate, and the railways have applied a proportional rate of 11 cents up to Omaha, whereas the indictment states they should have charged 16 cents, which is the local rate.

The state's attorney of Cook county, Ill., has filed a bill in the circuit court asking leave to file a petition for a quo warranto writ ordering the Pittsburgh, Ft. Wayne & Chicago to show by what right it is exercising the privileges of a corporation in Illinois. This action follows a decision by the Illinois Supreme Court in mandamus proceedings started by the owner of a piece of property 50 ft. x 100 ft., against which the Pittsburgh, Ft. Wayne & Chicago has begun condemnation proceedings for terminal purposes. The company offered to pay $50,000, while the owner demanded $115,000. The case was carried to the Supreme Court on the ground that the charter of the railway expired in February, 1912, under the so-called railroad act of 1849 limiting railway charters to fifty years, and that therefore the company had no power to condemn the property. The railway claims that the road was not incorporated under that act. The Supreme Court in its decision held that the property owner had sufficient interest to require the state's attorney to institute proceedings.

ARGENTINE RAILWAY CONCESSION.—A bill granting a railway concession to C. T. Moujan from San Rafael, in central eastern Argentina, southwest to Bahia Blanca, on the Atlantic coast, about 300 miles, has been definitely sanctioned by the Argentine congress.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Charles B. McCann has been appointed auditor of the Marietta, Columbus & Cleveland, with headquarters at Marietta, O., in place of F. Lehenstrom, resigned.

A. E. Rosevear, assistant general freight agent of the Grand Trunk at Montreal, Que., has been appointed assistant to vice-president, with office at Montreal.

J. M. Warner, general manager of the Chicago & Western Indiana, and the Belt Railway of Chicago, has been elected also vice-president and general manager of the Belt Railway of Chicago.

H. S. Simpson has been appointed land, tax and claim agent of the Chicago & Alton, with headquarters at Chicago. He will have charge of all matters in connection with real estate, taxes and personal injury claims.

Luther Burns has been appointed assistant attorney for Kansas, Nebraska and Colorado for the Rock Island Lines, with headquarters at Topeka, Kan. Mr. Burns is assistant to Paul E. Walker, who was appointed attorney for Kansas, Nebraska and Colorado, with office at Topeka, upon the retirement of M. A. Low under the pension rules of the company August 1.

William H. White, whose appointment as comptroller of the Philadelphia & Reading Railway, and the Reading Company, with headquarters at Philadelphia, Pa., has been announced in these columns, has been connected with the various departments of the Reading system for about 34 years. He was born in Montgomery county, Pa., on April 21, 1852, and entered the service of the Philadelphia & Reading Railroad on December 1, 1878, in the comptroller's office. He was later transferred to the office of auditor of merchandise traffic, then to the office of the auditor of coal traffic, and subsequently back to the comptroller's office. On August 18, 1898, he was made chief clerk and general bookkeeper in the comptroller's office, of the Philadelphia & Reading Railway, which position he held at the time of his recent apopintment as comptroller of the Philadelphia & Reading Railway and subsidiary companies, also of the Reading Company, as above noted.

W. H. White.

Operating Officers.

See an item in General News regarding changes in divisions of the Seaboard Air Line.

J. A. Courtright has resigned as trainmaster of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Wabash, Ind.

D. A. Mathers has been appointed assistant superintendent of the Guadalajara division of the Southern Pacific of Mexico, with headquarters at Orendain, Mex.

G. A. Stokes has been appointed acting terminal superintendent of the Grand Trunk, with office at Toronto, Ont., succeeding W. H. Farrell, assigned to other duties.

S. E. Ferguson, trainmaster of the Erie at Meadville, Pa., has been appointed superintendent of the Meadville division, with office at Meadville, succeeding Edgar W. Batchelder, promoted.

W. E. Livingston has been appointed trainmaster of the Ft. Worth & Rio Grande and St. Louis, San Francisco & Texas, with headquarters at Ft. Worth, Tex., in place of J. T. Hulehan.

W. A. Witt, superintendent of the Fifth division of the Seaboard Air Line, at Jacksonville, Fla., has been appointed general superintendent of the Norfolk Southern, with office at Norfolk, Va.

J. T. Hulehan has been appointed assistant superintendent of the Central division of the St. Louis & San Francisco, with headquarters at Ft. Smith, Ark., succeeding E. L. Magers, promoted.

W. C. Downing, superintendent of the St. Louis division of the Vandalia, has been appointed superintendent of the Pittsburgh division, of the Pennsylvania Lines West of Pittsburgh, with headquarters at Pittsburgh, Pa., succeeding P. A. Bonebrake transferred.

Robert L. Milton has been appointed superintendent of terminals of the Wabash, with office at Kansas City, Mo. John Shields, assistant trainmaster at Kansas City, has been appointed trainmaster, with headquarters at Moulton, Ia.

A. W. Montague has been appointed acting superintendent of terminals of the Texas & Pacific, with headquarters at Ft. Worth, Tex., in place of S. E. Burkhead, superintendent of terminals, who has been granted a leave of absence.

Owing to the illness of W. S. Becker, general superintendent, Western general division of the Norfolk & Western, the jurisdiction of A. C. Needles, general superintendent, Eastern general division, has been extended, temporarily, over the Western general division.

W. A. Hamler, trainmaster of the Beech Creek subdivision of the New York Central & Hudson River at Jersey Shore, Pa., has been appointed trainmaster of the Fall Brook subdivision, with headquarters at Corning, N. Y., succeeding F. D. Clark. W. M. Corbin, assistant trainmaster of the Fall Brook subdivision, at Dresden, N. Y., succeeds Mr. Hamler, and J. S. Vail succeeds Mr. Corbin.

J. T. Johnson, superintendent of the Cleveland division of the Baltimore & Ohio, at Cleveland, Ohio, has been promoted to general agent of the Cleveland and Akron territory with headquarters at Cleveland, and W. T. Lechlider, assistant superintendent of the Cleveland division, succeeds Mr. Johnson. C. W. Gorsuch, assistant superintendent of the Pittsburgh division, has been appointed superintendent of the Newark division succeeding M. H. Cahill, resigned to go to another company.

F. H. Worthington, superintendent of the Michigan division of the Vandalia, with office at Logansport, Ind., has been appointed superintendent of the St. Louis division, with headquarters at Terre Haute, Ind., to succeed W. C. Downing. F. L. Campbell, superintendent of the Peoria division, succeeds Mr. Worthington. W. D. Wiggins, division engineer of the Pennsylvania Lines at Pittsburgh, Pa., takes the place of Mr. Campbell as superintendent of the Peoria division of the Vandalia, with headquarters at Decatur, Ill.

C. W. Gorsuch, who has been appointed superintendent of the Newark division of the Baltimore & Ohio, entered the service of the Baltimore & Ohio on July 15, 1898, as train despatcher at Newark, O., and on January 1, 1902, was transferred to Pittsburgh in the same capacity. He was promoted to assistant trainmaster of the Pittsburgh division on January 1, 1903, and in May, 1907, was made chief clerk to the general superintendent, at Pittsburgh, becoming chief clerk to the general superintendent of transportation, at Baltimore, in July, 1911. He was promoted to assistant superintendent of the Pittsburgh division of the Baltimore & Ohio on August 10, 1912, which position he held at the time of his recent appointment as superintendent of the same road as above noted.

W. T. Lechlider, who has been appointed superintendent of the Cleveland division of the Baltimore & Ohio, began railway work on April 1, 1883, as a messenger in the general offices of the Baltimore & Ohio, at Baltimore, Md. After learning telegraphy he became a clerk and operator and was advanced to train despatcher in August, 1885, becoming chief clerk of the transportation department on December 1, 1897. He was appointed chief clerk in the office of the general superintendent at Pittsburgh on October 1, 1900; and in November, 1903, was

made assistant to the general superintendent of transportation, later becoming special representative of the general manager. On December 1, 1910, he was made inspector of transportation and was appointed assistant superintendent of the Cleveland division of the Baltimore & Ohio on October 10, 1911, from which position he has been promoted to superintendent of the Cleveland division of the same road.

Leon F. Lonnbladh, who has been appointed superintendent of the Tennessee Central, with headquarters at Nashville, Tenn., as has been announced in these columns, was born on December 7, 1877, at Boras, Sweden, and graduated from Boras Technical College, Sweden, in June, 1898. The same month he began railway work as assistant engineer on the Boras-Herrljunga Railroad in Sweden, and then from September of the same year to May, 1899, was assistant engineer on various railroad surveys and locations, and then for a short time was locating engineer. From September, 1899, to April, 1902, he was consecutively assistant engineer, resident engineer and locating engineer on construction, on the Ystad-Brosarp Railroad in Sweden. In June, 1902, he was appointed office engineer of the Tennessee Construction Company and from December, 1903, to August, 1904, was assistant engineer of the Tennessee Central. He was then made engineer of construction and in December, 1904, was appointed chief engineer of the same road. From December, 1905, to February, 1907, he was assistant to chief engineer of construction on the Southern Railway, and from February, 1907 to January, 1908, was principal assistant engineer on construction of the New Orleans, Texas & Mexico, and the Beaumont, Sour Lake & Western. He was then in charge of location work for six months and on July 1, 1908, was appointed chief engineer of the Tennessee Central, and now becomes superintendent also of the same road.

John T. Cheek, who has been appointed acting superintendent of the National Railways of Mexico, with headquarters at Gomez Palacio, Durango, Mex., was born on December 10, 1871, at Cleveland, Tenn., and was educated in the common schools. He began railway work in May, 1891, with the East Tennessee, Virginia & Georgia, now a part of the Southern Railway, as operator on work trains. He was later transferred as night operator to Cleveland, Tenn., and then was appointed clerk to the chief despatcher at Knoxville, Tenn. In September, 1893, he was promoted to train despatcher, and in September, 1901, was made chief despatcher at Selma, Ala. In January, 1902, he was transferred to Knoxville, Tenn., and resigned from the Southern Railway on September 1, 1903, to go to the Illinois Central as despatcher at Carbondale, Ill. In December, 1903, he was made chief despatcher at Paducah, Ky., and in September, 1904, was made transportation representative of the same company at St. Louis, Mo., to handle the World's Fair business. He was later despatcher of the same road at Carbondale until March, 1905, when he went to the Southern Pacific Company at Tucson, Ariz., as despatcher. In September, 1906, he went to the Mexican Central, now a part of the National Railways of Mexico, as despatcher at Chihuahua. The following month he was made chief despatcher at Jimulca, and was then transferred to Gomez Palacio. On February 1, 1908, he was promoted to trainmaster, and in May, 1911, was made acting superintendent of the Gomez Palacio and the Torreon divisions. He was then superintendent of the Torreon division, with headquarters at Torreon, Coahuila, until September, 1911, and then trainmaster, first at Torreon, and later at Gomez Palacio, which position he held at the time of his recent appointment as acting superintendent, as above noted.

J. T. Cheek.

Traffic Officers.

J. R. Mockbee has been appointed commercial agent of the St. Louis Southwestern at Greenville, Tex.

M. Ellingsworth has been appointed a soliciting freight agent of the Mobile & Ohio, with office at New York.

John C. Willis has been appointed soliciting agent of the Louisville & Nashville, with office at Mobile, Ala., succeeding Geo. C. Willings, resigned.

R. S. Morris has been appointed soliciting freight agent of the Tennessee Central with office at Atlanta, Ga., succeeding Geo. F. Hobart, resigned.

J. A. McKay has been appointed commercial agent of the New York Central Lines, with office at New Haven, Conn., succeeding H. C. Wessman, promoted.

C. D. Whitney has been appointed general freight agent of the Chicago, Peoria & St. Louis, with headquarters at St. Louis, Mo., to succeed C. W. Galligan, resigned.

W. A. Ross has resigned as assistant general passenger agent of the Great Northern Railway and Great Northern Steamship Company, with headquarters at Seattle, Wash.

W. W. Breedlove has been appointed general agent of the Atlanta, Birmingham & Atlantic, with headquarters at Talladega, Ala., succeeding R. S. Morris, commercial agent, resigned.

C. B. Willcox has been appointed general freight and passenger agent of the Tehuantepec National, with office at Rincon Antonio, Oaxaca, Mexico, succeeding H. E. Moore, resigned.

J. F. Kelly, traveling freight agent of the Chicago Great Western at Des Moines, Ia., has been appointed commercial agent, with headquarters at Des Moines, succeeding F. M. Steele, resigned.

Hugo C. Wessman has been appointed division freight agent of the New York Central & Hudson River and the West Shore, with headquarters at Utica, N. Y., succeeding George H. Clark, transferred.

M. L. Whitaker has been appointed traveling passenger agent of the Illinois Central, with headquarters at St. Paul, Minn., succeeding V. E. Labbe, who has been transferred to Dallas, Tex., as traveling passenger agent.

E. D. Kyle, freight traffic manager of the Seaboard Air Line, at Norfolk, Va., has been appointed traffic manager of the Norfolk Southern, with office at Norfolk, and the office of acting general freight agent has been abolished.

C. H. Jackson has been appointed general agent of the Missouri Pacific and St. Louis, Iron Mountain & Southern, with headquarters at Denver, Col., succeeding R. M. McWilliams, who has been transferred to Little Rock, Ark., as assistant general freight agent in place of Mr. Jackson.

L. E. Chalenor, general freight agent of the Seaboard Air Line at Norfolk, Va., has been appointed freight traffic manager, succeeding E. D. Kyle resigned to accept service elsewhere. G. S. Rains, assistant general freight agent at Norfolk, succeeds Mr. Chalenor, and H. G. Waring succeeds Mr. Rains.

Engineering and Rolling Stock Officers.

R. I. Wilby, assistant engineer of the Toledo, Peoria & Western, at Peoria, Ill., has been appointed engineer maintenance of way, with office at Peoria.

C. P. Hammond, assistant engineer of roadway of the Central of Georgia at Savannah, Ga., has been appointed engineer of maintenance of way, with headquarters at Savannah.

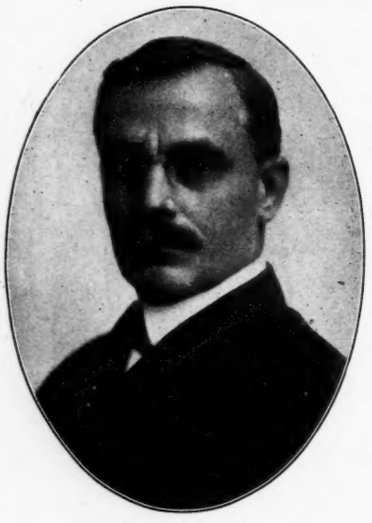
Nels Osgard has been appointed master mechanic of the Superior division of the Great Northern, and T. W. Callahan has been appointed master mechanic of the Mesabi division, both with headquarters at Superior, Wis.

G. Le Boutillier, division engineer of the Pennsylvania Lines West at Cincinnati, Ohio, has been appointed engineer of the Pittsburgh division, with office at Pittsburgh, Pa., succeeding W. D. Wiggins, promoted, and E. F. McCrea, division engineer at Toledo, Ohio, has been appointed engineer of the Cincinnati division, with office at Cincinnati, Ohio, succeeding Mr. Le Boutillier. G. R. Barry succeeds Mr. McCrea.

Harold Knight, division engineer of the Erie at Salamanca, N. Y., has been appointed engineer of the New York and the Greenwood Lake divisions, the Northern Railroad of New Jersey, and the New Jersey & New York, with office at Jersey City, N. J., succeeding R. C. Falconer, transferred. Joseph W. Foote, division engineer of the New York, Susquehanna & Western at Jersey City, succeeds Mr. Knight, and Arthur B. Caldwell succeeds Mr. Foote.

H. Clewer, master mechanic of the Chicago, Rock Island & Gulf, with headquarters at Fort Worth, Tex., has been appointed superintendent of locomotive operation of the Rock Island Lines, with office at Chicago; effective November 1. He will superintend the work of the supervisors of locomotive operation, through the master mechanics, to effect further economies in the use of fuel, locomotive supplies, lubricating material, and in the operation of the locomotive. He will also render every assistance possible, through the various officers, to improve the maintenance, efficiency and operation of the locomotive by further instructive methods, in order that the cost of locomotive operation may be reduced and its efficiency improved.

Charles A. Dunham, signal engineer of the Great Northern, has been appointed signal engineer of the Grand Trunk, with headquarters at Montreal, Que. Mr. Dunham was born October 20, 1866, at Hamilton, Ont. He was educated in the public schools of Ontario, at night schools in Chicago, and by correspondence courses in engineering. He entered the railway service in 1884 in the capacity of helper in the mechanical department of the Chicago, Burlington & Quincy at Chicago. In April, 1886, he took a position in the bridge department of the New York, Chicago & St. Louis. In 1887 he was for three months with the U. S. Rolling Stock Company, of Hegewisch, Ill. In September of that year he entered the service of Grant Brothers, railroad contractors. Returning to the Burlington in January, 1890, he worked for that road in the capacity of locomotive fireman and brakeman until September, 1892. From then until March, 1896, he was with the Union Switch & Signal Company, and the National Switch & Signal Company. In March, 1896, he was appointed inspector of signals for the Illinois Central. Three years later he was made signal engineer of that road, and in June, 1905, was appointed signal engineer of the Great Northern, which position he held until the time of his recent appointment as signal engineer of the Grand Trunk.



C. A. Dunham.

W. P. Critchfield, assistant supervisor of division No. 5, Philadelphia division of the Pennsylvania Railroad, has been appointed supervisor at Kittanning, Pa., succeeding H. H. Garrigues, transferred. R. W. E. Bowler, assistant supervisor of division No. 26, Philadelphia division, succeeds Mr. Critchfield, and J. F. Hunter succeeds Mr. Bowler. W. B. Carpenter has been appointed supervisor, with headquarters at Reynoldsville, Pa., succeeding W. V. Betts, transferred. T. E. Lightfoot, supervisor at Osceola Mills, Pa., has been appointed supervisor at Reading, Pa., succeeding D. C. Baird, transferred. F. M. Robb, supervisor at Titusville, Pa., succeeds Mr. Lightfoot. A. M. Williams, assistant supervisor No. 7, Middle division, succeeds Mr. Robb, and Fred Evans, succeeds Mr. Williams. W. V. Betts has been appointed supervisor at Dunkirk, N. Y., succeeding H. B. Welsh, transferred.

H. E. Brashares has been appointed assistant signal engineer of the Great Northern, with headquarters at St. Paul, Minn., succeeding Charles A. Dunham, resigned to accept service with another company. He was born in Janesville, Ill., September 5, 1881. He attended the common schools there and at Harvey, Ill., and graduated from the Thornton Township high school in 1899. He went to work in the machine shop of the Whiting Foundry Company, at Harvey, in June of the same year, and continued in that work until September, 1901, when he entered Armour Institute of Technology, of Chicago. He graduated in the electrical engineering course at Armour in June, 1905, and entered the signal department of the Illinois Central in September of the same year as draftsman and inspector. In April, 1907, he left the Illinois Central to go with the Continental Signal Company in Chicago in the capacity of designing engineer. He received the degree of electrical engineer from Armour Institute in June, 1908. He was with the Continental Signal Company until June 1, 1910, when he was appointed signal supervisor for the Chicago & Western Indiana. On October 1, 1911, he was made signal inspector for the Great Northern, with headquarters at St. Paul, and on November 1, 1912, was appointed to his present position as assistant signal engineer of that road.

OBITUARY.

W. Robinson, traveling passenger agent of the Grand Trunk Railway, at Pittsburgh, Pa., died on November 2.

George G. Thompson, Jr., division freight agent of the Southern Railway at Greensboro, N. C., was shot and killed in his office at Goldsboro on October 29, by a discharged employee. Mr. Thompson was born on May 4, 1867, at Culpeper, Va. He entered the service of the Richmond & Danville, now a part of the Southern Railway in 1884, as a clerk, and since April, 1900, has been division freight agent of the Southern Railway.

Clinton B. Conger, one of the founders of the Traveling Engineers' Association, and its first president, having presided over the convention at Chicago in 1893; at Denver, Col., in 1894; at Pittsburgh, Pa., in 1895; at Minneapolis, Minn., in 1896, and Chicago in 1897; died on October 29, at the age of 65. Mr. Conger was the treasurer of that association at the time of his death, and had held that position for a number of years. He took a very active part in the upbuilding of the association. At the time of his death he was a traveling representative of William Sellers & Co., Philadelphia, Pa., which position he had held since May 1, 1908. Mr. Conger was formerly editor of *Railway and Locomotive Engineering*, and had written a number of books on engineering subjects.

Horace W. Clarke, formerly second vice-president and general manager of the Denver & Rio Grande, died November 1 at Frederick, Md., aged 58 years. Mr. Clarke began railway work in January, 1872, as machinist apprentice with the Northern Central. He held various minor positions until 1878, when he became trainmaster of the Chicago, St. Louis & New Orleans, and was subsequently superintendent of the Louisville division of the Illinois Central and assistant division superintendent and division superintendent of the Mississippi division of that road until June, 1890, when he went to the Mobile & Ohio as superintendent of the St. Louis division. He was promoted to superintendent of transportation of that road in August, 1902, and resigned in November, 1907, to accept the position of second vice-president and general manager of the International & Great Northern. Mr. Clarke later was made second vice-president and general manager of the Denver & Rio Grande, which position he resigned in September, 1911, on account of ill health.

Wages in the Malay States.—The wages paid the workmen in the shops of the Federated Malay States Railways are comparatively high for that part of the world. Smiths and boilermakers receive 66 cents per eight-hour day, machine men 33 cents to 72 cents, fitters 33 cents to $1.29, carpenters 41 cents to 77 cents, and pattern makers 77 cents to $1.29. The rate for all apprentices is 16½ cents. Most of the castings are made by contract with a Chinese master foundryman, who receives 77½ cents per cwt. for iron castings and pays his own helpers, the iron and fuel being supplied by the railway company.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

THE ERIE has ordered a number of locomotives.

THE UNITED STATES NAVY is inquiring for 1 locomotive.

THE CANADA IRON CORPORATION is inquiring for 2 locomotives.

BUTLER BROTHERS, St. Paul, Minn., are inquiring for 2 locomotives.

THE LONG ISLAND has ordered 6 freight locomotives from the American Locomotive Company.

THE JONESBORO, LAKE CITY & EASTERN has ordered 2 mogul locomotives from the Baldwin Locomotive Works.

THE NORTHWESTERN IRON COMPANY has ordered 1 six-wheel switching locomotive from the Baldwin Locomotive Works.

THE CHICAGO & NORTH WESTERN has ordered 29 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE MILWAUKEE COKE & GAS COMPANY has ordered 1 four-wheel switching locomotive from the Baldwin Locomotive Works.

THE CHICAGO, BURLINGTON & QUINCY has ordered 5 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA has ordered 5 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE CHICAGO, ROCK ISLAND & PACIFIC is in the market for 30 Pacific type locomotives, 25 mikado locomotives, and 30 switching type locomotives.

CAR BUILDING.

THE ERIE has ordered a number of passenger and freight cars.

THE PACIFIC FRUIT EXPRESS has ordered 2,000 refrigerator cars from the American Car & Foundry Company.

THE SAN ANTONIO & ARANSAS PASS has ordered 1,000 box cars from the American Car & Foundry Company.

THE NEW YORK, ONTARIO & WESTERN is in the market for 500 hopper cars, 400 flat cars, 300 box cars, 50 stock cars, and 50 refrigerator cars.

THE CHICAGO, ROCK ISLAND & PACIFIC is in the market for 10 baggage cars, 12 smoking cars, 20 coaches, 18 chair cars, 8 dining cars, 1,000 box cars, 500 coal cars, 250 refrigerator cars and 50 caboose cars.

THE MAINE CENTRAL, mentioned in the *Railway Age Gazette* of October 25 as being in the market for 300 rack cars, 100 flat cars and 100 gondola cars, has ordered the rack cars from the Laconia Car Company, and the flat cars and gondola cars from the Standard Steel Car Company.

THE NEW YORK, NEW HAVEN & HARTFORD, mentioned in the *Railway Age Gazette* of November 1 as having ordered 50 coaches from the Osgood Bradley Car Company, has cancelled this order and has ordered 100 all-steel passenger coaches from the Standard Steel Car Company.

THE NORTHERN PACIFIC, mentioned in an unconfirmed item in last week's issue as having placed orders for cars, has ordered 2,500 box cars and 1,100 refrigerator cars from the Pullman Company, 200 ore cars and 500 gondolas from the Pressed Steel Car Company, and 250 stock cars from the Whipple Car Company instead of from the Mt. Vernon Car & Manufacturing Company as reported.

IRON AND STEEL.

THE LOUISVILLE & NASHVILLE has ordered 5,500 tons of structural material from the Virginia Bridge & Iron Company for all the bridges on its new line between Winchester, Ky., and Athol.

Supply Trade News.

H. F. Ball, vice-president of the American Locomotive Company, New York, has resigned his position with that company.

C. R. Jamison has resigned as sales manager of the Acme Supply Company, Chicago, to engage in business on his own account at Danville, Va.

The S. Jarvis-Adams Company has changed its name to the Pittsburgh Iron & Steel Foundries Company, with general offices at its works at Midland, Pa.

The Minneapolis, St. Paul & Sault Ste. Marie is using the patents of the Moore Patent Car Company, St. Paul, Minn., in the construction of 300 refrigerator cars.

A. Lichtenhein, Canadian representative of the Galena-Signal Oil Company, Franklin, Pa., with office in New York, died at his home in New Rochelle, N. Y., on October 31.

The Bohn system of refrigeration for cars, manufactured by the White Enamel Refrigerator Company, St. Paul, Minn., has recently been installed on refrigerator cars for the Illinois Central; the Minneapolis, St. Paul & Sault Ste. Marie; the Great Northern and the Chicago, Milwaukee & St. Paul.

J. T. Dickerson, eastern representative of the Strauss Bascule Bridge Company, has been appointed contracting engineer, with headquarters at the Chicago office. J. I. Vincent has been appointed eastern representative, with headquarters at 30 Church street, New York, and P. L. Kaufman, who has been located at the Chicago office, will return to the Pacific coast, establishing headquarters at Seattle. Mr. Vincent has been connected with the Scherzer Rolling Lift Bridge Company for nine years as its eastern representative.

Owing to the desire of P. T. Walsh to retire from active work the Walsh Construction Company, of Davenport, Ia., has been reorganized by incorporation under the laws of Iowa with a capital stock of $200,000. Mr. Walsh will continue his connection with the company as chairman of the board, and will be succeeded as president by his son, T. J. Walsh. P. F. McCarthy, a contractor of Davenport, Ia., has been elected first vice-president; J. Reid Lane, second vice-president; D. R. Lane, treasurer, and J. C. Dunn, secretary. The officers of the company with G. D. French will constitute the board of directors. Mr. Dunn is a member of the firm of Dunn & McCarthy, contractors, of Chicago. The reorganized company will take over the work started by the old company on the Chicago, Milwaukee & St. Paul and other work in the West.

TRADE PUBLICATIONS.

MOTOR TRUCKS.—The Cleveland-Galion Motor Truck Company, Cleveland, Ohio, has published bulletin No. 1 on its Dynamic motor truck. These trucks are driven by electric motors and are designed to handle freight in warehouses, factories, terminals and docks. The information given in the bulletin is largely general and will be superseded by later bulletins describing the various types of trucks in detail.

SAFETY GRINDING WHEELS.—The Travelers Insurance Company, Hartford, Conn., has published the first of a series of pamphlets, to be devoted to general accident prevention, on grinding wheels, in which it makes a number of recommendations for the construction and equipment of grinding wheels with the idea of rendering them as safe as possible. The booklet also discusses the causes of accidents and gives tables showing revolutions per minute corresponding to certain rim velocity in feet per minute.

ELECTRIC AIR DRILLS.—The Ingersoll-Rand Company, New York, has devoted form No. 4,209 to Temple-Ingersoll electric air rock drills, and form 384-F and form No. 601 to instructions for installing and operating these drills and furnishing duplicate part lists. The electric air drill is driven by pulsations of compressed air created by pulsators actuated by a standard electric motor. The air is never exhausted, but is simply used over and over again, playing back and forth in a closed circuit.

Railway Construction.

Alabama Great Southern.—See Queen & Crescent.

Alberta, Peace River & Eastern.—Arrangements have been made, it is said, to build this line in Canada from Hudson bay across the Peace river district to the Pacific coast. Work on the first section is to be started as soon as snow is off the ground, between Edmonton, Alta., and the Peace river country. The company intends to establish a line of steamers to England to handle the wheat crop. Lord Farrer, Lord Vivien, Guy G. Wilson, James Millington and Francis D. Cochins are interested. (March 22, p. 700.)

Baltimore & Ohio.—The report of this company for the year ended June 30, 1912, shows that the more important improvements completed during the year were: Change of line and reduction of curvature at the west end of the Susquehanna river bridge; the construction of 0.33 miles of double track in open cut at Bakerstown, Pa., and the elimination of the single track tunnel at that point; change of line and reduction of grade between Blaser, W. Va., and west end of Kingwood tunnel, including the construction of a double track tunnel which has been completed and is now in operation; at Curtis Bay, Md., there has been added 9.43 miles of yard tracks, and a new westbound passenger station yard with 5.74 miles of tracks has been constructed at Brunswick, Md. At Lorain, Ohio, 12.06 miles of tracks in the classification and receiving yard has been put in operation. Additional yard tracks have been completed at Baltimore, Md., at Frederick, at Cumberland, at Hutton, at Keyser, W. Va., at Rowlesburg, at Blaser, at Hardman, at Grafton, at Clarkesburg and at Hartzel, at Johnstown, Pa., at Cleveland, Ohio, at Chicago Junction and at Cincinnati, at McCool, at Washington, Ind., at Flora, Ill., and at Cone. There was an increase of 11.84 miles of first track chiefly to the extension of the Quemahoning branch, and second track has been increased 41.9 miles, mostly on the Chicago division. There was an increase of 8.61 miles of third track and 6.05 miles of fourth track principally on the Cumberland and Connellsville divisions. The larger improvements now under way include additions to track and betterment of the line in the Somerset coal district, work on the section of the Quemahoning branch between Rockwood, Pa., and Garrett, 7 miles, is expected to be finished during the next fiscal year. Work is well advanced on a section of second track on the Chicago division, aggregating 84.7 miles. Much of this has been completed and put in operation, and it is expected that all of this work will be finished by November, 1912. The construction of 1.8 miles of new line including a double track tunnel 4,000 ft. long, through the Allegheny mountains between Sand Patch, Pa., and Manila has progressed steadily during the year, and it is expected that the work will be finished about January, 1913. When this work is completed the company will have a continuous double track from Philadelphia, Pa., to Chicago, Ill., with the exception of about 34 miles on the Chicago division. At Somerset, Pa., there has been 4.53 miles of yard tracks laid, and work is well under way on additional yard tracks and engine facilities, which will be completed during the coming fiscal year. Additions to the terminals at Chicago Junction, Ohio, have been made by lengthening the yard tracks. During the year 201 side tracks and industrial branches were constructed.

Butler County.—An officer of this company, which operates a line from Linstead, Mo., to Menorkenut, 30 miles, writes that the company is carrying out work with its own forces on an extension of 20 miles; also between Linstead and Poplar Bluff, 8 miles.

Canadian Pacific.—This company has been authorized to extend the Bassano-Irricane line from mile 36.8, near Standard, Alta., to mile 50.3, near Hussar.

Central Railway.—An officer writes that a contract has been given to C. J. Wills & Sons, Montreal, Que., for work on this line. The plans call for building from Montreal, via Hawksbury, Ottawa, Carleton Place, Bannockburn, Fenelon Falls and Orillia to a point on Georgian bay, about 340 miles. Track has been laid on about 60 miles. The company expects to develop a traffic in grain, lumber, minerals, general country produce and manufactured goods. William Owen, president, C. N. Armstrong, vice-president and managing director, and F. Stuart Williamson, chief engineer, 44 Beaver Hall Hill, Montreal.

Chicago, Burlington & Quincy.—The report of this company for the year ended June 30, 1912, shows that on the extension from Kirby, Wyo., to Powder river, track has been laid on 85.3 miles to a point southeast of Thermopolis, and grading is finished except at Alkali Summit, where a temporary track has been laid; tunnels and approaches are yet to be finished. Part of the right of way for the Hudson-Greeley line in Colorado was also bought during the year, as well as additional land for needed facilities at Chicago, at St. Louis, Mo., at Denver, Colo., and at other points. New second track was laid at various points, and 43 miles of second track and 43.6 miles of yard tracks and sidings were put in operation during the year. The company laid 321.46 miles of new 90-lb. rail and 59.71 miles of new 100-lb. rail during the year, replacing rails of lighter weight. At Metropolis, Ill., a double-track incline is being constructed on the bank of the Ohio river to enable barges to moor alongside the cars, so that timber and ties may be loaded direct.

Grand Trunk Pacific.—According to press reports surveys are about finished for the line from Regina, Sask., west to Lethbridge, and the company is making preliminary surveys in the mountains for a direct line from Lethbridge west to Vancouver, B. C. This line is to be built between the main line of the Canadian Pacific and the international boundary, but if a suitable route cannot be found the line may be built south of the international boundary.

Louisville & Nashville.—A contract has been awarded to the Foster-Creighton-Gould Company, of Nashville, Tenn., for furnishing and erecting the metal work on all bridges on its new line between Winchester, Ky., and Athol, which will require 5,500 tons of steel.

Oregon Roads.—According to press reports a contract has been given to Willett & Burr, San Francisco, Cal., to build a 20-mile line from Myrtle Point, Ore., along the South fork of the Coquille river to a point near the Curry county line. The line is to be built for the Smith-Powers Logging Company and it is expected that the work will be finished by July, 1913.

Peoples Railroad (Electric).—An officer writes that this company has recently completed its organization and plans to build from Fairhope, Ala., on the shore of Mobile bay east via Silverhill to Robertsdale on the Louisville & Nashville, about 14 miles. The company will probably use gas electric cars for the motive power. On one section of the line the maximum grade will be 5 per cent., and on the rest of the line it will be 3 per cent. There will be two bridges of 400 ft. and 300 ft. respectively. E. B. Gaston, president, Fairhope, and B. F. Bond, engineer.

Queen & Crescent.—An officer is quoted as saying that improvements are to be carried out at Birmingham, Ala., to provide additional yards for the Alabama Great Southern between First avenue and the railroad tracks. The team tracks between Eighteenth and Twentieth streets are also to be improved.

St. Elmo & Belle Helene.—An officer writes that a contract has been given to W. A. Howell, St. Elmo, La., to build from St. Elmo via Darrell and Belle Helene to Gonzales, and the work has been started. There will be about 30 trestles on the line, and gasolene motor cars will be used. The company will put up a station at St. Elmo, and expects to develop a traffic in sugarcane, garden truck and miscellaneous vegetables. George W. Reese, president, and D. A. Webb, chief engineer, 432 Audubon building, New Orleans, La.

Southern Illinois Railway & Power Company (Electric).—An officer writes that contracts have been given to the W. H. Schott Company, Chicago, to build from Eldorado, Ill., southwest via Wasson Muddy, Harrisburg, Dorrisville and Ledford to Carriers Mills, about 15 miles. The work is now under way and involves handling about 20,000 cu. yds. a mile. Maximum grades will be 1 per cent., and maximum curvature 5 degrees. The company will put up a power house and shop buildings, and expects to develop a traffic in passengers and freight. W. H. Schott, Chicago, is chief engineer.

Winnipeg Electric.—An officer writes that work is now under way building the Stonewall branch of the Winnipeg, Selkirk & Lake Winnipeg from Middlechurch west through the

parish of St. Paul, thence in a nodthwesterly direction to the base of Stony mountain, about 9 miles. The company plans to put up two sub-stations on the line. F. Morton Moore is president, and Wilford Phillips is chief engineer. (October 18, p. 775.)

WINNIPEG, SELKIRK & LAKE WINNIPEG (Electric).—See Winnipeg Electric.

RAILWAY STRUCTURES.

AMARILLO, TEX.—The Gulf, Colorado & Santa Fe is planning to erect a new general office building and to enlarge its division terminal.

BOCA GRANDE, FLA.—The Charlotte Harbor & Northern is planning the construction of a creosoting plant. Creosote storage tanks will be located at Boca Grande, and the treating plant at Hull.

HOUSTON, TEX.—It is reported that work will be started within ninety days on the new $300,000 passenger station for the Missouri, Kansas & Texas.

HUTTON, MD.—The report of the Baltimore & Ohio for the year ended June 30, 1912, shows that new station buildings were completed at Hutton, Md., at Terra Alta, W. Va., at Dola, at Paint Creek, Pa., at Sharpsburg, at Ellwood City, at Nabbs, Ind., at Noble, Ill., and at Sharps, and the station buildings at Baltimore, Md., and at Cumberland were extensively remodeled and improved. Additions to the terminals at Chicago Junction, Ohio, have been made, the passenger station at that point is being remodeled and a subway to carry Front street under the tracks is being constructed. Considerable bridge renewal work was also carried out, including the structures over the Hocking river, the Embarras river and the Wabash river. The elimination of grade crossings in the cities of Baltimore, Md., and Chicago has progressed steadily during the year, and this work will be extended over a period of years. The work at Columbus, Ohio, is about finished.

LOUISVILLE, KY.—According to press reports work has been started on new shops for the Louisville Railway Company at Twenty-ninth street and Garland avenue, in Louisville. The plans call for three one-story brick buildings. One building is to be an electric repair shop, another a paint shop, and the third a carpenter shop.

LUDLOW, KY.—Important improvements to the terminals at Ludlow just across the Ohio river from Cincinnati, are to be undertaken at once by the Cincinnati, New Orleans & Texas Pacific. The work includes the construction of a twenty stall brick engine house, 85 ft. long, each stall to be equipped with drop pit; brick oil house 30 ft. x 60 ft., with basement; modern coal chute of 500 tons capacity with bucket hoist; double concrete cinder pit 100 ft. long; and the necessary new tracks and changes of present tracks to serve the improved facilities.

MOUNT PLEASANT, IOWA.—The report of the Chicago, Burlington & Quincy for the year ended June 30, 1912, shows that new stations are in course of construction at Mount Pleasant, at Fairfield, at Aurora, Neb., at Seward and at Sheridan, Wyo. Brick and steel freight houses are being put up at St. Joseph, Mo., at Omaha, Neb., at Des Moines, Iowa, and at Ottumwa; also a new brick and steel passenger station is being put up at Galesburg, Ill. Work on the new general office building at Chicago is progressing, and it is expected that the building will be ready for business during 1912. At Metropolis, Ill., the dock facilities are being improved.

TAYLOR, TEX.—The Missouri, Kansas & Texas has asked bids for the construction of a new passenger station to cost approximately $40,000.

VICTORIA, TEX.—The St. Louis & San Francisco has awarded a contract for a new passenger station.

WILLISTON, N. C.—The Southern Railway will soon erect a combination freight and passenger station at Williston. A contract for the work has been given to the Elliott Building Company, Hickory, N. C. The new building will have waiting rooms for white and colored passengers, and a freight room 15 ft. x 50 ft. There will be a covered cotton platform 22 ft. x 261 ft.

Railway Financial News.

BOSTON & ALBANY.—The New York Central & Hudson River and the New York, New Haven & Hartford are to issue $5,220,000 Boston & Albany equipment trust certificates of 1912. At the expiration of the trust the New Haven will own half the equipment and the New York Central the other half.

BOSTON & MAINE.—The company has asked the railroad commission of Massachusetts for permission to issue $10,663,700 additional common stock and $7,500,000 4½ per cent. bonds.
See also Fitchburg Railroad.

DURANGO CENTRAL.—A bondholders' protective committee has been formed consisting of T. H. Watkins, chairman; B. S. Harmon and Buell Hollister, with Thomas Robinson, secretary, New York. The committee is empowered to prepare a plan of reorganization and asks the deposit with the U. S. Mortgage & Trust Company, New York, of the Durango Central's first mortgage 50-year 5 per cent. bonds.

FITCHBURG RAILROAD.—This company has asked permission from the New York Public Service Commission, Second district, to issue $400,000 20-year 4½ per cent. bonds to reimburse the Boston & Maine for improvements and addition to the property.

GRAND TRUNK.—This company is to apply to the Canadian parliament for authority to issue additional consolidated debenture 4 per cent. stock to an amount not to exceed £5,000,000 $25,000,000).

GRAND TRUNK PACIFIC.—The company is to ask the Canadian parliament to authorize a further issue of perpetual or terminable debenture stock not to exceed $25,000,000, and to apply the proceeds of the sale of such stock for construction and equipment purposes.

GREEN BAY & WESTERN.—*The Commercial & Financial Chronicle* says that C. W. Cox, of New York, secretary and treasurer of the Green Bay & Western, has given to F. H. Prince & Co., Boston, representing, it is said, the Minneapolis & St. Louis interests, an option up to March 1, 1913, on 18,750 shares out of the total outstanding 25,000 shares of the Green Bay & Western. The purchase price is $110 a share, and this offer is open to minority stockholders who may deposit their stock with Robert Winthrop & Co., New York, for sale under the option.

MINNEAPOLIS & ST. LOUIS.—See Green Bay & Western.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—Percy Warner, of Nashville has been elected director in the place of the late J. B. Richardson, and J. M. Shofner, of Shelbyville, has been elected to succeed R. M. Dudley.

NEW YORK CENTRAL & HUDSON RIVER.—Speyer & Company, New York, have bought $6,925,000 first consolidated mortgage 4½ per cent. series A bonds of 1912-1962 of the New York State Railways, and are offering these bonds for sale at 94½. The New York Central & Hudson River owns $13,604,300 of the $19,952,400 common stock of the New York State Railways. The New York State Railways operate 585 miles of track.
See Boston & Albany.

NEW YORK, NEW HAVEN & HARTFORD.—See Boston & Albany.

NEW YORK STATE RAILWAYS.—See New York Central & Hudson River.

NEW YORK, WESTCHESTER & BOSTON.—Harris, Forbes & Company, and Kissel, Kinnicutt & Company, both of New York, have sold an additional $2,000,000 of the first mortgage 4½ per cent. bonds of 1911. There are now outstanding $19,300,000 of these bonds. A portion of the money realized from the sale of these bonds by the New York, Westchester & Boston may be applied to the extension from White Plains, N. Y., to Danbury, Conn., which entire extension, it is estimated, will cost about $7,000,000.

PERE MARQUETTE.—The trustee of the consolidated 4 per cent. bonds has appealed to the United States circuit court of appeals from the district court's authorization of $3,500,000 receivers' certificates.

WABASH.—The circuit court of appeals has granted the receivers permission to pay the interest matured November 1 on the $5,000,000 4½ per cent. 3-year notes.

[ADVERTISEMENT.]

ANNUAL REPORTS

BALTIMORE & OHIO RAILROAD COMPANY—EIGHTY-SIXTH ANNUAL REPORT.

OFFICE OF THE BALTIMORE & OHIO RAILROAD COMPANY,
BALTIMORE, MD., October 31, 1912.

To the Stockholders of The Baltimore and Ohio Railroad Company.

The President and Directors herewith submit report of the affairs of the Company for the fiscal year ended June 30, 1912.

PROPERTIES AND MILEAGE.

The statements in this report show the results of the operations of the lines directly operated by The Baltimore and Ohio Railroad Company, embracing:

Miles of Road	4,381.30
Trackage Rights	73.76
Total Operated Mileage	4,455.06

as shown in detail in Table 26.

There has been a net increase in first track of 21.32 miles, chiefly due to the extension of the Quemahoning Branch, and to the resumption of operations over that portion of your line from Kane Junction to Mt. Jewett, Pa., formerly leased.

INCOME FOR THE YEAR.

The General Income Account of the Company for the year will be found in Table 1. Except where otherwise indicated the comparisons herein shown are with the corresponding period and figures for the preceding fiscal year.

The Gross Earnings from rail operations were $92,594,322.87, an increase of $4,449,319.11, or 5.05 per cent.

The earnings from Freight Traffic were $72,465,544.28, an increase of $4,835,607.27, or 7.15 per cent.

The tons of freight carried were 64,704,070, an increase of 4,156,183 tons, or 6.86 per cent. The tons of freight carried one mile were 12,490,418,797, an increase of 786,879,352, or 6.72 per cent. The ton miles per mile of road were 2,803,648, an increase of 6.21 per cent. The revenue from freight per mile of road was $16,265.90, an increase of 6.64 per cent. The revenue per freight train mile was $3.21 68/100, an increase of $.67 3/100, or 26.32 per cent.

The average distance each ton was carried was 193.04 miles compared with 193.29 miles the previous year. The average earnings per ton per mile were 580/1000 cents, an increase of 2/1000 cents. This increase in average earnings per ton per mile is incident to handling a larger proportion of higher class freight, and not to increase in rates charged. On the contrary there were decreases ranging from 5 per cent. to 10 per cent. in the coal rates from Pittsburgh and West Virginia regions to the Lakes, effective May, 1912, which apply to a considerable tonnage. Freight Traffic Statistics are given in Tables 12 and 13.

It will be noted from Statement of Commodities Carried, Table 14, that tonnage decreases were quite general through the commodities grouped as Products of Agriculture, Products of Animals, Products of Forest, and in many items of Manufactures, resulting probably from the unfavorable weather conditions and the apathy in commerce and manufacture which prevailed in the earlier period of the year. There was a marked increase, however, in the latter part of the year in the Products of Mines and in certain branches of Manufactures, anticipating, perhaps, the revival in general manufactures and commerce.

The earnings from Passenger Traffic—were $14,754,911.71, a decrease of $453,520.44, or 2.98 per cent.

The number of passengers carried was 22,178,298, an increase of 209,132, or .95 per cent.; notwithstanding this increase, the number of passengers carried one mile was 766,169,876, a decrease of 29,715,010, or 3.73 per cent., and the number of passengers carried one mile per mile of road was 171,977, a decrease of 7,529, or 4.19 per cent. The average number of miles each passenger was carried was 34.55, a decrease of 1.68 miles, but the number of passengers carried per mile of road was 4,978, an increase over last year of 23. The average earnings from each passenger decreased $.02 7/10 and the average earnings per passenger per mile increased 15/1000 cents. These fluctuations were occasioned by a decrease in the long distance business, mainly due to the decline in immigrant traffic, and also to an increase in commuter travel. Passenger Traffic Statistics will be found in Tables 10 and 11.

The earnings from Express Traffic—were $1,746,703.19, a decrease of $33,643.73, and from the Transportation of Mails $1,120,161.99, a decrease of $48,906.21.

The Operating Expenses—for the year were $64,709,537.59, an increase of $1,943,470.55, or 3.10 per cent.

The expenditures for Maintenance of Way and Structures aggregated $11,365,454.29, an increase of $1,085,838.47, or 10.56 per cent., averaging $2,551.13 per mile of road, an increase of $232.63 over the previous year.

The expenditures for Maintenance of Equipment were $16,651,534.40, an increase of $769,914.02 or 4.85 per cent.

The total maintenance expenses for the year were $28,016,988.69, equal to 30.26 per cent. of the Gross Earnings and 43.30 per cent. of the Total Expenses.

The expenditures above referred to, in addition to the ordinary maintenance charges, include $1,554,357.00 expended in reconstruction and in connection with the revision of facilities; and also $2,708,239.55 for depreciation of equipment. As of June 30, 1912, there were held in reserve, after thorough shopping, 78 of the heavier type of locomotives.

The total cost of conducting transportation was $32,751,234.35, a decrease of $67,265.51 under the preceding year. The ratio of Transportation Expenses to Gross Earnings was 35.37 per cent. as compared with 37.23 per cent. of last year.

The Net Earnings from Rail Operations—were $27,884,785.28, an increase of $2,505,848.56, while Outside Operations show a deficit of $666,639.99, making the Total Net Revenue $27,218,145.29, an increase of $1,987,520.71.

Taxes Accrued—aggregate $2,984,948.49, an increase of $388,698.69, or 14.97 per cent.

Other Income—was $4,390,905.94, a decrease of $505,692.35, due to lessened interest receipts from loans and balances, as such funds were reduced by application for betterments and equipment.

Deductions from Gross Corporate Income—for Interest on Funded Debt, Rents, etc., were $14,726,044.33, an increase of $15,062.49.

From Net Corporate Income—amounting to $13,898,058.41, dividends aggregating 4 per cent., or $2,355,058.52, were paid on the Preferred Stock, leaving balance to be transferred to Profit and Loss of $11,542,999.89. With this transfer, and after deductions incident to miscellaneous adjustments made during the year, the net balance to the credit of Profit and Loss was $49,875,503.55, out of which dividends aggregating 6 per cent., or $9,121,072.56 were paid on the Common Stock. The net accretion to the Profit and Loss Account for the year was $2,302,011.70.

ASSETS AND LIABILITIES.

The General Balance Sheet will be found in Table 2 and attention is called to the following items therein contained.

Property Investment—Road and Equipment—shows a net increase for the year of $14,957,845.72

carried as follows:

Road		$11,969,912.91	
Equipment		5,502,837.20	
		$17,472,750.11	
Less: General Expenditures	$3.05		
Reserve for Accrued Depreciation—Equipment	2,514,901.34	2,514,904.39	$14,957,845.72

Property Investment—Securities—shows an increase of $615,566.18, which is the cost of additional securities of subsidiary lines acquired during the year.

Other Investments—under Property Investment, shows an increase for the year of $477,005.70, and is made up of advances to controlled lines, the purchase of additional real estate and the acquisition of additional securities not pledged.

Working Assets—show a decrease of $7,181,517.98. This is principally accounted for by the withdrawal of special deposits carried in Loans and Bills Receivable and application of such withdrawals to additions and betterments. The item Marketable Securities—Miscellaneous, shown as an increase, is the result of a transfer to this account from that of Miscellaneous Accounts Receivable, which latter item reflects a decrease. Reference is made to the General Balance Sheet for the other items of increase and decrease in this grouping, which are self-explanatory.

Deferred Debit Items—increased $8,104,906.16. Of this amount $7,215,392.10, in Special Deposits, represents the balance of the $10,000,000.00 proceeds from sale of Certificates issued under the Equipment Trust of February, 1912, and will be expended for equipment now under contract.

Common Stock—shows a net increase in the issue of $10,000.00 by reason of the conversion of an equal amount of Convertible Debenture Bonds, thus retiring all of such bonds outstanding. The changes in Preferred Stock are incident to exchange of old underlying securities of the Company and of constituent companies.

Mortgage, Bonded and Secured Debt—increased $11,747,703.66

explained as follows:

First Mortgage Bonds	$1,000,000.00	
Issued under provisions of the mortgage in recoupment of construction expenditures, and held in the treasury.		
Certificates of Interest, B. & O. Equipment Trust of February, 1912	10,000,000.00	
Issued for the purchase of equipment.		
Real Estate Mortgages and Ground Rent Liens on property acquired, capitalized	859,003.66	
Other bonds issued in exchange for underlying securities	1,700.00	
	$11,860,703.66	
Less: Underlying bonds acquired during the year, viz.:		
B. & O. R. R. Extended 4 per cent. bonds, due 1935	$61,000.00	
P. & C. R. R. Extended 4 per cent. bonds, due 1946	52,000.00	113,000.00 $11,747,703.66

ADDITIONS TO ROAD AND EQUIPMENT.

The extensive program for additions and betterments authorized and directed by the Board from time to time during the past three years, and for which provision was made through the issue of the Company's Three Year Notes, is nearing completion. Much of the more important work has been completed and an indication of the benefits to be expected from these improvements is reflected in the operations of the year.

In this connection it will be noted that the Company was enabled during the past year to carry 786,879,352 additional tons one mile, or an increase of 6.72 per cent., with no additional transportation cost; in fact, there was a decrease of $67,265.51 under the preceding year. That there should be this decreased cost in transportation, notwithstanding an increase of 6.72 per cent. in total tons carried one mile, with consequent increase of over 7 per cent. in freight earnings, is largely due to the raising of the average train load (excluding Company's material) to 554.46 tons compared with 440.68 tons the preceding period, an increase of 113.78 tons, or 25.82 per cent. Coincident with this increased train load, the earning per revenue

freight train mile averaged $3.21 68/100, an increase of $.67 3/100, or 26.32 per cent. With the final completion of the work now under way, it is believed that a considerably larger volume of business may be handled and with more marked economy.

The immediate response to these increased facilities, however, in the way of additional developments on your Company's lines, suggests the necessity in the near future of further expansion, particularly at terminal points, and the addition of equipment necessary to care for the constantly growing traffic.

Below and in Table 25 will be found in detail the statement of equipment acquired during the year which embraced 105 locomotives, 78 steel passenger cars, 3,814 new and 1,400 reconstructed freight cars, 9 work cars and 1 tug boat, 1 steel car float and 1 lighter. The total amount charged to capital account of Equipment for the year was $7,586,420.16. The equipment in service has been well maintained and a liberal amount has been charged to operating expenses for depreciation.

Table 6 shows the capital expenditures made during the year grouped under the more important sub-divisions of Additions and Betterments accounts aggregating $11,975,877.86; the difference between this amount and the increase in Investment since June 30, 1907—Road, $11,969,912.91, shown in the General Balance Sheet, Table 2, is occasioned by book adjustments.

ROAD.

Some of the more important improvements completed during the year were:

Change of line and reduction of curvature at the west end of the Susquehanna River bridge.

Construction of .33 miles of double track in open cut at Bakerstown, Pa., and elimination of single track tunnel at that point.

The change of line and reduction of grade between Blaser and West End of Kingwood Tunnel, W. Va., including the construction of the double track tunnel, referred to in the last Annual Report, has been completed and put in operation. This improvement, by giving three tracks through this summit, relieves the congestion incident to the former single track tunnel at this point, and the grade reduction effected in connection therewith shortens the eastbound helper grade approximately four miles, with consequent economies in operation.

There have been added 9.43 miles of yard track at Curtis Bay, Md. A new westbound classification yard, with 5.74 miles of track, has been constructed at Brunswick, Md. There have been put in operation 12.06 miles of track in the classification and receiving yard at Lorain, Ohio. Additional yard tracks have been built at Baltimore, Frederick, Cumberland and Hutton, Md.; Keyser, Rowlesburg, Blaser, Hardman, Grafton, Clarksburg and Hartzel, W. Va.; Johnstown, Pa.; Cleveland, Chicago Junction and Cincinnati, Ohio; McCool and Washington, Ind.; and Flora and Cone, Ill.

There has been an increase in first track constructed of 11.84 miles, due, chiefly, to the extension of the Quemahoning Branch. The second track has been increased 41.90 miles, mostly on the Chicago Division. There were increases of 8.61 miles of third track and 6.05 miles of fourth track, principally on the Cumberland and Connellsville Divisions.

New station buildings were completed at Hutton, Md.; Terra Alta and Dola, W. Va.; Paint Creek, Sharpsburg and Ellwood City, Pa.; Nabbs, Ind.; and Noble and Sharps, Ill. The station buildings at Baltimore and Cumberland, Md., were extensively remodeled and improved.

There were 12 new interlocking plants built and 7 reconstructed. Automatic signals were installed for 19.7 miles of double track and 16.4 miles of single track. Electro-manual block signals were installed for 3.3 miles of double track and 20.1 miles of single track.

The following are some of the larger improvements now under way:

ADDITIONS TO TRACK AND BETTERMENT OF ROAD.

To provide for the increased traffic originating in the Somerset Coal District there is now under construction that portion of the Quemahoning Branch Railroad between Rockwood and Garrett, Pa., 7 miles, to be completed during the next fiscal year.

The construction of second track on the Chicago Division, authorized during the past two years, and aggregating 84.7 miles, is well advanced. Much of it has been completed and put into operation and the balance, it is expected, will be completed about November 1, 1912.

The construction of 1.8 miles of new line, including double track tunnel 4,000 feet in length, through the Allegheny Mountains, between Sand Patch and Manila, Pa., has progressed steadily during the year and is expected to be completed about January 1, 1913. A very serious restriction to the movement of traffic over this division will then have been removed, and continuous double track will extend from Philadelphia, Pa., to Chicago, Ill., with an exception of about 34 miles on the Chicago Division.

ADDITIONS AND BETTERMENTS TO YARDS AND TERMINAL FACILITIES.

At Somerset, Pa., there have been 4.53 miles of yard tracks laid; the additional yard tracks and engine facilities are well under way and will be completed during the coming fiscal year. These improvements are necessary in connection with the new Quemahoning Branch Railroad extension, and to take care of the general increase in traffic in this region.

Additions to the terminals at Chicago Junction, Ohio, have been made by lengthening the yard tracks, to take care of the longer trains now running to and from that terminal. The passenger station at that point is being remodeled and a subway carrying Front Street under the tracks is being constructed.

RENEWAL OF BRIDGES AND ELIMINATION OF GRADE CROSSINGS.

Considerable progress has been made in renewing bridges for use of heavier power. Among the more important bridges renewed were those across the Hocking, Embarras and Wabash Rivers.

Elimination of grade crossings in the Cities of Baltimore, Md., and Chicago, Ill., has progressed steadily during the year, in accordance with the arrangements with these Cities, and will, as previously stated, extend over a period of years. The work at Columbus, Ohio, has been practically completed.

EQUIPMENT.

Total Book Value of Equipment, June 30, 1911, was		$87,515,152.49
During the year there was added to the equipment the following: 105 Locomotives, 78 Passenger Cars, 5,214 Freight Cars, 9 Work Cars and 1 Tug Boat, 1 Steel Car Float and 1 Lighter, on which payments were made amounting to	$7,544,258.93	
And Betterments were added costing	42,161.23	7,586,420.16
		$95,101,572.65
During the year the following equipment was put out of service and credited to Property Investment—Equipment: 102 Locomotives, 14 Passenger Cars, 5,460 Freight Cars, 345 Work Cars and 8 pieces of Floating Equipment, having a book value of		2,083,582.96
Making the Gross Book Value of Equipment		$93,017,989.69
From this should be deducted:		
Reserve for Accrued Depreciation, as follows—		
Amount at credit, June 30, 1911	$8,297,959.62	
Amount charged to Expenses for depreciation, year ended June 30, 1912	2,749,281.75	
	$11,047,241.37	
Less: Charges to this account for depreciation accrued on equipment put out of service during the year	234,380.41	
Credit Balance Reserve for Accrued Depreciation, June 30, 1912		10,812,860.96
Leaving Net Value of Equipment, June 30, 1912		$82,205,128.73

During the year 1,400 steel freight cars, acquired from 1899 to 1901, were reconstructed, and equipped with more suitable draft rigging and safety devices.

On February 1, 1912, there were issued $10,000,000.00 equipment obligations of the Baltimore and Ohio Equipment Trust of February, 1912, under which there had been acquired to June 30, 1912, 8 Locomotives, 24 Passenger Cars, and 3,785 Freight Cars. These locomotives and cars are included in the statement of equipment added during the year. The following additional equipment is under contract for this Trust: 50 Locomotives and 6,215 Freight Cars, and will be delivered within the next fiscal year.

SUBSIDIARY LINES.

The Income Accounts of the following lines, owned but separately operated, are shown in Exhibits A, B and C, viz.:

The Staten Island Railway Company	12.64 miles.
The Staten Island Rapid Transit Railway Company	10.89 "
The Baltimore and Ohio Chicago Terminal Railroad Company	77.14 "
	100.67 miles.

INDUSTRIAL DEPARTMENT.

One hundred and eighty-six new industries, manufacturing and commercial, were located on or immediately adjacent to your line during the year, from which the Company should derive substantial freight revenues. Two hundred and one side tracks and industrial branches were constructed; ninety-five to the newly located industries; forty-two to industries previously located but without side track facilities; the balance being additions to or extensions of facilities at existing plants.

By the use of special educational trains, the latest results in scientific agriculture were presented to more than 22,000 farmers by demonstrators and lecturers from the Experiment Stations of the various States served by the System lines.

During the year an Agricultural Agent was appointed, charged with the duty of developing the agricultural interests of the System; of inducing immigration; aiding in diversification of crops; advising farmers as to the crops best suited to their soil, and in various other ways encouraging the development of the agricultural possibilities of the lands contiguous to the System.

INSURANCE FUND.

A summary of the operations for the year ended June 30, 1912, and a statement of the assets and liabilities are shown in Table 23. The surplus in this Reserve Fund at June 30, 1912, was $1,326,962.42.

RELIEF DEPARTMENT.

The report of the Relief Department for the twelve months ended June 30, 1912, will be printed, as customary, for distribution to members. The operations of the department, covering the Relief, Savings and Pension Features, will be found in Table 24 of this report.

* * * * *

The President and Directors acknowledge with pleasure the loyal and efficient services of the officers and employees during the past year.

By order of the Board,

DANIEL WILLARD,
President.

CONDENSED INCOME ACCOUNT FOR YEAR.

	1912.	INCREASE OR DECREASE.
GROSS EARNINGS, RAIL OPERATIONS	$92,594,322.87	$4,449,319.11 Inc.
TOTAL EXPENSES, RAIL OPERATIONS	64,709,537.59	1,943,470.55 Inc.
Net Earnings from Operation	$27,884,785.28	$2,505,848.56 Inc.
Percentages of Expenses to Earnings	69.88	1.33 Dec.
OUTSIDE OPERATIONS	Def.$666,639.99	$518,327.85 Dec.
Total Net Revenue	$27,218,145.29	$1,987,520.71 Inc.
Taxes Accrued	2,984,948.49	388,698.69 Inc.
Operating Income	$24,233,196.80	$1,598,822.02 Inc.

OTHER INCOME	4,390,905.94	505,692.35 Dec.
Gross Corporate Income	$28,624,102.74	$1,093,129.67 Inc.
TOTAL DEDUCTIONS FROM INCOME: RENTS, INTEREST, HIRE OF EQUIPMENT, ETC.	14,726,044.33	15,062.49 Inc.
Net Corporate Income	$13,898,058.41	$1,078,067.18 Inc.
Net Corporate Income		$13,898,058.41
Dividend payments on Preferred Stock, 4%		2,355,058.52
Income Balance Transferred to Profit and Loss		$11,542,999.89
Amount to Credit of Profit and Loss, June 30, 1911	$38,452,419.29	
Less Sundry Adjustments—Net Debit Balance	119,915.63	38,332,503.66
		$49,875,503.55
Dividend Charges to Surplus, Common Stock 6%		9,121,072.56
Amount to Credit of Profit and Loss, June 30, 1912		$40,754,430.99

CONDENSED GENERAL BALANCE SHEET FOR YEAR.

	1912.	INCREASE OR DECREASE.
ASSETS:		
Total Property Investment	$334,215,545.10	$17,472,747.06 Inc.
Less: Reserve for Accrued Depreciation (Equipment)	Cr. 10,812,860.96	Cr. 2,514,901.34 Inc.
Net Property Investment	$323,402,684.14	$14,957,845.72 Inc.
Total Securities: Proprietary, Affiliated and Controlled Companies	185,479,548.78	615,566.18 Inc.
Total Other Investments	55,425,343.26	477,005.70 Inc.
Total Property and Other Investments	$564,307,576.18	$16,050,417.60 Inc.
Working Assets—Cash Securities, etc.	47,446,888.76	7,181,517.98 Dec.
Deferred Debit Items	10,622,776.37	8,104,906.16 Inc.
Grand Total	$622,377,241.31	$16,973,805.78 Inc.
LIABILITIES:		
Common Stock	$152,246,987.76	$10,000.00 Inc.
Preferred Stock	59,989,246.50	2,280.00 Inc.
Stock Liability for Conversion of Outstanding Securities	81,433.74	2,280.00 Dec.
Total Stock Liability	$212,317,668.00	$10,000.00 Inc.
Total Funded Debt	343,882,779.32	11,747,703.66 Inc.
Total Capital Liabilities	$556,200,447.32	$11,757,703.66 Inc.
Working Liabilities	12,098,177.10	2,323,908.48 Inc.
Accrued Liabilities not Due	7,486,452.99	207,676.47 Inc.
Deferred Credit Items	3,283,011.43	227,642.90 Inc.
SURPLUS:		
Additions to Property through Income since June 30, 1907	1,227,759,06	
Invested in Other Reserve Funds	1,326,962.42	154,862.57 Inc.
Profit and Loss Balance	*40,754,430.99	2,302,011.70 Inc.
Grand Total	$622,377,241.31	$16,973,805.78 Inc.

*Including $10,965,168.91 Additions to Property through Income prior to June 30, 1907.

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY—FIFTY-EIGHTH ANNUAL REPORT.

Chicago, July 1, 1912.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

The following is the report of your Board of Directors for the year ended June 30, 1912:

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY, YEARS ENDED JUNE 30,

Per Cent.	1912.	OPERATING REVENUES.	1911.	Per Cent.
66.58	$57,740,418.62	Freight Revenue	$58,033,242.91	65.74
24.31	21,083,418.74	Passenger Revenue	22,552,567.22	25.55
2.73	2,368,447.34	Mail Revenue	2,375,713.68	2.69
2.98	2,578,810.37	Express Revenue	2,493,252.45	2.83
2.34	2,031,281.77	Miscellaneous Transportation Revenue	1,879,828.61	2.13
.91	788,588.94	Revenue from Operations other than Transportation	832,357.32	.94
.15	132,102.19	Joint Facilities	105,246.08	.12
100.00	$86,723,067.97	Total Operating Revenue	$88,272,208.27	100.00
		OPERATING EXPENSES.		
15.61	$13,541,030.39	Maintenance of Way and Structures	$12,406,278.81	14.05
16.48	14,294,032.69	Maintenance of Equipment	14,761,137.51	16.72
1.76	1,528,114.63	Traffic Expenses	1,581,805.25	1.79
33.47	29,020,384.11	Transportation Expenses	28,543,204.54	32.34
2.61	2,263,387.34	General Expenses	2,249,499.55	2.55
69.93	$60,646,949.16	Total Operating Expenses	$59,541,925.66	67.45
30.07	$26,076,118.81	Net Operating Revenue	$28,730,282.61	32.55
	122,700.51	Net Deficit from Outside Operations	107,089.13	
	$25,953,418.30	Total Net Revenue	$28,623,193.48	
	3,303,058.11	Taxes Accrued	3,049,124.17	
	$22,650,360.19	Operating Income	$25,574,069.31	
		OTHER INCOME.		
	$ 614,749.50	Rents	$ 676,479.42	
	1,536,294.65	Miscellaneous Interest	1,498,219.45	
	$ 2,151,044.15	Total Other Income	$ 2,174,698.87	
	$24,801,404.34	Gross Corporate Income	$27,748,768.18	
		DEDUCTIONS FROM GROSS CORPORATE INCOME.		
	$ 1,469,055.04	Rents	$ 1,610,636.54	
	13,493.46	Miscellaneous Interest	3,702.07	
	8,547,309.04	Interest Accrued on Funded Debt	8,626,369.54	
	657,978.58	Sinking Funds	662,310.50	
	6,814.44	Discount on Funded Debt	1,986.80	
	$10,694,650.56	Total Deductions	$10,905,005.45	
	$14,106,753.78	Net Corporate Income	$16,843,762.73	
	$ 8,867,128.00	Dividends	$ 8,867,128.00	
	3,944,216.08	Appropriations for Betterments	4,826,755.01	
	$12,811,344.08		$13,693,883.01	
	$ 1,295,409.70	Surplus for the Year	$ 3,149,879.72	

MILEAGE STATISTICS.

ITEM.	1912. Miles.	1911. Miles.	Increase or Decrease, Miles.
LOCOMOTIVE MILEAGE—Revenue Service.			
Freight Locomotive Miles	18,375,751	18,339,226	Inc. 36,525
Passenger Locomotive Miles	17,892,325	17,703,619	Inc. 188,706
Mixed Locomotive Miles	851,499	909,707	Dec. 58,208
Special Locomotive Miles	19,580	11,436	Inc. 8,144
Switching Locomotive Miles	8,914,030	9,260,623	Dec. 346,593
Total	46,053,185	46,224,611	Dec. 171,426
Locomotive Mileage—Non-revenue Service	2,075,482	1,854,949	Inc. 220,533
CAR MILEAGE—Revenue Service.			
Freight Car Mileage:			
Loaded	421,665,175	413,501,696	Inc. 8,163,479
Empty	181,749,213	177,727,113	Inc. 4,022,100
Caboose	16,756,425	16,649,388	Inc. 107,037
Total	620,170,813	607,878,197	Inc. 12,292,616
Passenger Car Mileage:			
Passenger	45,718,181	46,429,369	Dec. 711,188
Sleeping, Parlor and Observat'n	26,862,496	25,902,599	Inc. 959,897
Other Passenger Train Cars	40,584,537	39,689,610	Inc. 894,927
Total	113,165,214	112,021,578	Inc. 1,143,636
Car Mileage in Special Service:			
Freight, Loaded	248,069	132,703	Inc. 115,366
Freight, Empty	44	.....	Inc. 44
Caboose	18,700	10,902	Inc. 7,798
Passenger	74,265	38,797	Inc. 35,468
Sleeping, Parlor and Observat'n	331	.....	Inc. 331
Other Passenger Train Cars	187	.....	Inc. 187
Total	341,596	182,402	Inc. 159,194
Total Car Mileage—Revenue Service	733,677,623	720,082,177	Inc. 13,595,446
Car Mileage—Non-rev. Service	9,075,026	10,885,312	Dec. 1,810,286
TRAIN MILEAGE—Rev. Service.			
Freight Train	16,688,629	16,608,998	Inc. 79,631
Passenger Train	17,422,976	17,303,893	Inc. 119,083
Mixed Train	846,642	903,712	Dec. 57,070
Special Train	19,067	10,902	Inc. 8,165
Total Train Mileage — Revenue Service	34,977,314	34,827,505	Inc. 149,809
Train Mileage—Non-rev. Service	1,279,407	1,289,761	Dec. 10,354

CAPITALIZATION.
CAPITAL STOCK.

Number of Shares.	Total Par Value Authorized and Outstanding.	Dividends Declared During the Year. Rate.	Amount.
1,108,391	$110,839,100.00	8%	$8,867,128.00

FUNDED DEBT.
TOTAL PAR VALUE.

Description of Bond.	Authorized.	Outstanding.	In Treasury, in Sinking Funds or Pledged as Collateral.	In Hands of Public.	Interest Accrued During Year.
Mortgage	$208,806,000	$191,713,800	$20,900,400	$170,813,400	$7,706,299.12
Collateral Trust	7,968,000	7,310,200	5,227,100	2,083,100	292,408.00
Plain or Debenture	13,300,000	10,829,000	2,956,000	7,873,000	548,601.92
Total	$230,074,000	$209,853,000	$29,083,500	$180,769,500	$8,547,309.04

TRAFFIC AND OPERATING STATISTICS.

ITEM.	1912. Dollars and Whole Numbers.	1912. Cents and Decimals.	1911. Dollars and Whole Numbers.	1911. Cents and Decimals.	Increase or Decrease. Dollars and Whole Numbers.	Increase or Decrease. Cents and Decimals.
PASSENGER TRAFFIC.						
Number of Passengers Carried Earning Revenue	22,404,120	.....	22,014,305	.....	Inc. 389,815	.....
Number of Passengers Carried One Mile	1,100,846,373	.....	1,173,435,093	.....	Dec. 72,588,720	.....
Number of Passengers Carried One Mile, per Mile of Road	121,314	.....	129,350	.....	Dec. 8,036	.....
Average Distance Carried, Miles	49	14	53	30	Dec. 4	16
Total Passenger Revenue	$21,083,418	74	$22,552,567	22	Dec. $1,469,148	48
Average Amount Received from each Passenger	.....	94105	$1	02445	Dec.	08340
Average Receipts per Passenger per Mile	.....	01915	.....	01922	Dec.	00007
Total Passenger Service Train Revenue	$26,721,933	24	$28,112,771	17	Dec. $1,390,837	93
Passenger Service Train Revenue per Mile of Road	$2,944	78	$3,098	92	Dec. $154	14
Passenger Service Train Revenue per Train Mile	$1	46264	$1	54401	Dec.	08137
FREIGHT TRAFFIC.						
Number of Tons Carried of Freight Earning Revenue	30,111,513	.....	28,328,338	.....	Inc. 1,783,175	.....
Number of Tons Carried One Mile	7,675,979,757	.....	7,116,005,120	.....	Inc. 559,974,637	.....
Number of Tons Carried One Mile per Mile of Road	845,900	.....	784,409	.....	Inc. 61,491	.....
Average Distance Haul of One Ton, Miles	254	92	251	20	Inc. 3	72
Total Freight Revenue	$57,740,418	62	$58,033,242	91	Dec. $292,824	29
Average Amount Received for each Ton of Freight	$1	91755	$2	04859	Dec.	13104
Average Receipts per Ton per Mile	.....	00752	.....	00816	Dec.	00064
Freight Revenue per Mile of Road	$6,363	04	$6,397	10	Dec. $34	06
Freight Revenue per Train Mile	$3	29282	$3	31378	Dec.	02096
OPERATING.						
Operating Revenue	$86,723,067	97	$88,272,208	27	Dec. $1,549,140	30
Operating Revenues per Mile of Road	$9,556	96	$9,730	40	Dec. $173	44
Operating Revenues per Train Mile	$2	47941	$2	53455	Dec.	05514
Operating Expenses	$60,646,949	16	$59,541,925	66	Inc. $1,105,023	50
Operating Expenses per Mile of Road	$6,683	35	$6,563	41	Inc. $119	94
Operating Expenses per Train Mile	$1	73389	$1	70962	Inc.	02427
Net Operating Revenue	$26,076,118	81	$28,730,282	61	Dec. $2,654,163	80
Net Operating Revenue per Mile of Road	$2,873	61	$3,166	99	Dec. $293	38
Average Number of Passengers per Car Mile	15	.....	16	.....	Dec. 1	.....
Average Number of Passengers per Train Mile	60	.....	64	.....	Dec. 4	.....
Average Number of Passenger Cars per Train Mile	6	19	6	15	Inc.	04
Average Number of Tons of Freight per Loaded Car Mile	18	20	17	21	Inc.	99
Average Number of Tons of Freight per Train Mile	437	75	406	33	Inc. 31	42
*Average Number of Freight Cars per Train Mile	35	37	34	71	Inc.	66
Average Number of Loaded Cars per Train Mile	24	05	23	61	Inc.	44
Average Number of Empty Cars per Train Mile	10	36	10	15	Inc.	21
Average Mileage Operated During Year	9,074	34	9,071	80	Inc. 2	54

* Including Cabooses.

EXPENDITURES FOR NEW LINES AND EXTENSIONS AND EQUIPMENT, AND FOR ADDITIONS AND BETTERMENTS, DURING THE YEAR.

ACCOUNT.	New Lines and Extensions.	Additions and Betterments. Charged to Road and Equipment.	Additions and Betterments. Charged to Income.	Total Expenditure.
I.—ROAD.				
Engineering	$13,679.77	Cr. $13,959.18	$13,982.78	$13,703.37
Right of Way and Station Grounds	71,928.61	489,891.77	.75	561,821.13
Real Estate	.....	919,510.58	.....	919,510.58
Grading	121,088.06	Cr. 221,147.94	286,978.59	186,918.71
Tunnels	130.85	Cr. 33,800.00	.....	Cr. 33,669.15
Bridges, Trestles and Culverts	106,387.58	153,035.72	413,967.14	673,390.44
Ties	11,357.46	33,261.87	Cr. 2,537.95	42,081.38
Rails	11,302.98	172,656.13	331,310.66	515,269.77
Frogs and Switches	24.69	41,549.76	8,888.55	50,463.00
Track Fastenings and Other Material	14,840.93	80,955.73	181,704.50	277,501.16
Ballast	25,965.80	90,809.00	131,997.45	248,772.25
Track Laying and Surfacing	1,076.59	146,678.86	69,421.44	217,176.89
Roadway Tools	225.87	Cr. 2,200.00	.....	Cr. 1,974.13
Fencing Right of Way	4,442.63	Cr. 20,874.36	739.15	Cr. 15,692.58
Crossings and Signs	1,045.94	14,711.37	100,295.55	116,052.86
Interlocking and Other Signal Apparatus	6,473.14	126,874.64	17,389.27	150,737.05
Telegraph and Telephone Lines	2,053.07	Cr. 8,533.50	19,659.25	13,178.82
Station Buildings and Fixtures	6,418.78	216,604.89	333,943.23	556,966.90
General Office Building and Fixtures	.....	.....	1,000,000.00	1,000,000.00
Shops, Engine Houses and Turn Tables	5.38	49,593.04	82,251.74	131,850.16
Shop Machinery and Tools	.....	29,142.69	47,560.09	76,702.78
Water Stations	9,624.58	7,249.72	73,818.06	90,692.36
Fuel Stations	Cr. 1,007.05	7,765.53	11,015.78	17,774.26
Storage Warehouses	.....	1,000.79	.....	1,000.79
Dock and Wharf Property	43,786.67	.....	776.36	44,563.03
Miscellaneous Structures	Cr. 2,047.32	3,450.55	22,710.28	24,113.51
Transportation of Men and Material	Cr. 15,091.11	40,748.00	.....	25,656.89
Rent of Equipment	16,713.70	.....	.....	16,713.70
Repairs of Equipment	612.32	.....	.....	612.42
Injuries to Persons	462.85	3.09	.....	465.94
Total	$451,502.87	$2,324,978.75	$3,145,872.67	$5,922,354.29
II.—EQUIPMENT.				
Steam Locomotives	.....	.....	$274,735.50	$274,735.50
Passenger Train Cars	.....	Cr. $9,955.24	21,527.04	11,571.80
Freight Train Cars	.....	3,156,507.12	476,904.83	3,633,411.95
Work Equipment	$1,633.86	340,914.11	19,081.71	361,629.68
Floating Equipment	.....	86,952.92	459.44	87,412.36
Total	$1,633.86	$3,574,418.91	$792,708.52	$4,368,761.29
III.—GENERAL EXPENDITURES.				
Law Expenses	$12.65	.....	.....	$12.65
Taxes	38.72	.....	.....	38.72
Other Expenditures	85.80	$1.43	$5,634.89	5,722.12
Total	$137.17	$1.43	$5,634.89	$5,773.49
Grand Total	$453,273.90	$5,899,399.09	$3,944,216,08	$10,296,889.07

EQUIPMENT.

ITEMS	Number on June 30, 1911.	Number Added During Year.	Number Retired During Year.	Number on June 30, 1912.	Average Tractive Power All Locomotives and Average Capacity All Freight Cars.
LOCOMOTIVES—Owned.					
Passenger	435	2	.....	437	.....
Freight	877	.....	4	873	.....
Switching	361	1	.....	362	.....
Total Locomotives	1,673	3	4	1,672	27,154 lbs.
CARS—Owned.					
Passenger Service:					
First-class Cars	664	9	13	660	.....
Combination Cars	233	.....	3	230	.....
Dining Cars	39	.....	2	37	.....
Baggage, Express and Postal Cars	259	23	14	268	.....
Parlor Cars	14	.....	.....	14	.....
Other Cars in Passenger Service	45	.....	.....	45	.....
Total	1,254	32	32	1,254	.....
Freight Service:					
Box Cars	27,553	4,707	2,663	29,597	.....
Flat Cars	1,336	.....	131	1,205	.....
Stock Cars	6,365	450	334	6,481	.....
Coal Cars	13,573	3,001	794	15,780	.....
Tank Cars	6	107	.....	113	.....
Refrigerator Cars	2,084	500	122	2,462	.....
Other Cars in Freight Service	93	.....	5	88	.....
Total	51,010	8,765	4,049	55,726	37.88 tons
Company's Service:					
Officers' and Pay Cars	31	1	.....	32	.....
Gravel Cars	979	.....	1	978	.....
Derrick Cars	34	6	.....	40	.....
Caboose Cars	670	31	21	680	.....
Other Road Cars	3,990	160	.....	4,150	.....
Total	5,704	198	22	5,880	.....
Total Cars Owned	57,968	8,995	4,103	62,860	.....

MILEAGE OF ROAD OPERATED.

STATE.	Line Owned.	Operated Under Lease.	Total Line Operated.
Illinois	1,672.43	58.45	1,730.88
Iowa	1,364.98	73.47	1,438.45
Missouri	1,122.38	10.89	1,133.27
Wisconsin	222.49	.53	223.02
Minnesota	23.61	14.84	38.45
Nebraska	2,850.34	22.37	2,872.71
Kansas	259.32	.82	260.14
Colorado	394.36	34.97	429.33
South Dakota	281.27	.....	281.27
Wyoming	482.75	.....	482.75
Montana	134.38	49.45	183.83
Total	8,808.31	265.79	9,074.10

LINE OWNED.

STATE.	Single Track.	Second Track.	Third Track.	Yard Track and Sidings.	Total.
Illinois	1,672.43	306.04	23.55	871.81	2,873.83
Iowa	1,364.98	244.49	.....	317.00	1,927.07
Missouri	1,122.38	100.75	.....	410.22	1,633.35
Wisconsin	222.49	32.14	.....	69.63	324.26
Minnesota	23.61	2.25	.....	29.98	55.84
Nebraska	2,850.34	17.99	.....	674.52	3,542.85
Kansas	259.32	.....	.....	23.58	282.90
Colorado	394.36	.....	.....	128.00	522.36
South Dakota	281.27	.....	.....	63.38	344.65
Wyoming	482.75	.....	.....	148.69	631.44
Montana	134.38	.....	.....	42.08	176.46
Total	8,808.31	703.66	23.55	2,779.49	12,315.01

NEW WORK.

Charges to Capital Account aggregating $6,352,672.99 were made during the fiscal year for additions to the property.

On the extension from Kirby to Powder River, Wyo., $215,350.08 has been expended this year. Track is laid for eighty-five and three-tenths miles southeast of Thermopolis; grading is finished except at Alkali Summit, where a temporary track has been laid; tunnels and approaches are yet to be finished.

The amount expended on the Hudson-Greeley Line, Colo., during the past year was $10,225.00 for right of way.

Additional land was purchased for needed facilities at Chicago, St. Louis, Denver and other points.

New second track costing $936,106.32 has been laid at various points, and freight and passenger stations rebuilt or enlarged where business required it. 43.06 miles of second track and 43.6 miles of yard tracks and sidings were put into operation during the year.

Approximately 14,705 feet of temporary trestle was replaced with permanent structures during the year.

321.46 miles of new 90-pound rail and 59.71 miles of new 100-pound rail were laid during the year, replacing rails of lighter weight.

A double-track incline is being constructed at Metropolis, Ill., on the bank of the Ohio River, to enable barges to moor alongside the cars so that timber and ties may be loaded direct without intermediate handling. The amount expended for this purpose during the year was $173,228.39. The dock facilities at this point are also being improved.

Automatic block signals were installed on the single track between Cameron Junction and Birmingham, Mo., a distance of 44.6 miles. They were installed also on the north track between Birmingham and Harlem, Mo., 8.2 miles.

A dispatchers' telephone circuit has been added between Napier, Mo., and Council Bluffs, Iowa, a distance of 93.7 miles, with sixteen stations. Dispatching of trains by telephone is now done on 2,589 miles of the road.

New station buildings are in course of construction at Mt. Pleasant and Fairfield, Iowa; at Aurora and Seward, Neb., and at Sheridan, Wyo.; brick and steel freight houses at St. Joseph, Mo., Omaha, Neb., and at Des Moines and Ottumwa, Iowa; also a new brick and steel passenger station at Galesburg, Ill.

Work on the new general office building at Chicago is progressing favorably, and it is expected the building will be ready for occupancy before the end of the present calendar year.

INCREASED EFFICIENCY.

The freight and passenger train revenues of the Company for the fiscal year 1912, compared with those of the previous year, were as follows:

	Freight Train Revenue.	Passenger Train Revenue.
1912	$57,740,418.62	$26,721,933.24
1911	58,033,242.91	28,112,771.17
Decrease	$ 292,824.29	$ 1,390,837.93
Total decrease		$ 1,683,662.22

An increase in revenue, however, from other operations, of $134,521.92, reduced the net decrease in total operating revenues to $1,549,140.30, or 1.8 per cent.

Notwithstanding these decreases in earnings, the business of the company showed an increase in revenue tons moved and passengers carried as follows:

	Tons.	Passengers.
1912	30,111,513	22,404,120
1911	28,328,338	22,014,305
Increase	1,783,175 or 6.3%	389,815 or 1.8%

For the fiscal year just closed, the average rate per ton per mile was 7.52 mills, the lowest in the history of the road. The average earnings per ton of freight carried was $1.917, which is less than that earned in any year since 1900. The average length of haul per ton was 245.92 miles, which, while an increase of 3.72 miles over 1911, is a decrease of 11.88 miles below the average haul in 1910. It is undoubtedly true, therefore, that the decreases noted in freight earnings per unit, while to some extent the result of a larger movement of low-grade traffic, were the result, in considerable measure, of reductions in important rates made by the Interstate Commerce Commission and certain of the State Commissions. In the passenger department the average amount received from each passenger was 94.1 cents, as compared with $1.024 in 1911 and $1.040 in 1910.

From these figures it is apparent that in volume of business transacted there has been a greater use made of the facilities of the Company during the past year, but this has been accompanied by a decrease both in gross earnings and in unit revenue for the service rendered. In order to meet the continued demand for more and better service and facilities, the Company has in past years expended very large sums in the reduction of grades and curvature, for more and longer side and passing tracks, heavier locomotives and larger equipment, whereby the train-load has been very greatly increased. This is to be seen from the fact that in 1901 the freight train miles (including mixed) were 19,314,987 as against 17,554,338 in 1912, or a decrease of 9.1 per cent. During the same period the ton miles increased from 3,871,337,916 to 7,675,979,757, or an increase of 98.3 per cent. In other words, in 1912 substantially twice the volume of freight business was handled, with nearly 10 per cent. less of freight train miles run to move it. During that period the average number of revenue tons per train mile increased from 200.43 in 1901 to 437.75 in 1912, or an increase of 118.4 per cent. The average number of tons per loaded car mile increased from 12.50 in 1901 to 18.2 in 1912, or an increase of 45.6 per cent.

In relation to these increases in volume of business, there has been the following relative increase in mileage:

	1912.	1901.	Increase, per cent.
Ton miles	7,675,979,757	3,871,337,916	98.3
Total operated mileage	12,638.24	9,998.85	26.4
Single main track mileage	9,074.10	7,789.46	16.5
Additional tracks, yard tracks and spurs	3,564.14	2,209.39	61.3

The increase of additional tracks, yard tracks and spurs, that is 61.3 per cent., in relation to the increase in volume of business during the period, shows a gratifying growth of yard and terminal facilities.

These various figures demonstrate that the efficiency of the transportation service performed by the Company has been enormously increased, and justify the very large expenditures that have been made to accomplish it. It is not to be expected, however, that the same proportionate increase in efficiency can be continued, at least without continued expenditures for necessary additions and improvements to the property.

DEMANDS OF THE FUTURE.

Furthermore, many improvements and additions, that in no way increase earnings, are demanded by the public in many places, and it is certain that sums required for these purposes will continue to be very large in the future. Elevation of tracks through towns and cities, elimination of grade crossings, both rail and highway, new and more expensive passenger stations are some of the expenditures of this class.

With the refusal of public authority to permit any increase of importance in rates, the problem of providing funds for these non-revenue-producing improvements has become more difficult. It is unwise to pledge the credit of the Company for expenditures of this character because there is no compensation for the increase in fixed charges that results, and a prudent regard for the welfare of the Company requires that such expenditures should be provided as far as possible out of income.

With the growth of business, the demand for increase in double tracking, side and passing tracks, grade and line revisions, new and enlarged terminals, new equipment, etc., may be expected to continue, and while a large amount of this character of new work has been done, there remains a great deal, of immediate and urgent importance, that must be accomplished during the near future if the Company is to maintain its power to economically and successfully respond to the demands upon it.

Following is the report of the General Auditor, with statements prepared by him.

By order of the Board of Directors.

DARIUS MILLER,
President.

GENERAL BALANCE SHEET, JUNE 30, 1912.

ASSETS.

Property Investment—Road and Equipment:		
Road	$336,894,788.52	
Equipment	62,394,465.08	
General Expenditures	1,521,601.39	$400,810,845.99
Reserve for Accrued Depreciation—Credit		17,838,321.92
Total		$382,972,533.07
Securities:		
Securities of Proprietary, Affiliated and Controlled Companies, Pledged—		
Stocks		$19,363,139.38
Securities Issued or Assumed, Pledged—		
Funded Debt		31,000.00
Securities of Proprietary, Affiliated and Controlled Companies, Unpledged—		
Stocks	$7,505,313.46	
Funded Debt	701,050.00	8,206,363.46
Total		$27,600,502.84
Other Investments:		
Advances to Proprietary, Affiliated and Controlled Companies for Construction, Equipment and Betterments		$402,259.91
Miscellaneous Investments—		
Physical Property	$1,487,386.78	
Securities Unpledged	1,489,356.26	2,976,743.04
Total		$3,379,002.95
Working Assets:		
Cash		$8,733,764.82
Securities Issued or Assumed, Held in Treasury—		
Funded Debt		10,625,800.00
Marketable Securities—		
Stocks	$756,572.12	
Funded Debt	68,400.00	824,972.12
Loans and Bills Receivable		2,895,531.14
Traffic and Car Service Bal. due from other Companies		692,578.58
Net Balance Due from Agents and Conductors		2,247,678.16
Miscellaneous Accounts Receivable		4,166,193.95
Materials and Supplies		6,806,179.77
Other Working Assets		49,309.43
Total		$37,042,007.97
Deferred Debit Items—		
Advances—		
Temporary Advances to Proprietary, Affiliated and Controlled Companies	$450,896.52	
Working Funds	117,880.36	
Other Advances	734,223.20	$1,303,000.08
Insurance Paid in Advance		147,722.62
Cash and Securities in Sinking Funds		18,281,800.61
Securities in Provident Funds		496,538.89
Unextinguished Discount on Funded Debt		311,198.76
Other Deferred Debit Items		2,217,234.35
Total		$22,757,495.31
Grand Total		$473,751,542.14

LIABILITIES.

Capital Stock:			
Common Stock			$110,839,100.00
Mortgage, Bonded and Secured Debt:			
Funded Debt—			
Mortgage Bonds—			
Held by Company		$10,068,800.00	
Not held by Company		181,645,000.00	$191,713,800.00
Collateral Trust Bonds—			
Held by Company		351,000.00	
Not held by Company		6,959,200.00	7,310,200.00
Plain Bonds—			
Held by Company		237,000.00	
Not held by Company		10,592,000.00	10,829,000.00
Total			$209,853,000.00
Working Liabilities—			
Traffic and Car-service Balances due to other Companies			$1,669,784.79
Audited Vouchers and Wages Unpaid			7,955,601.59
Miscellaneous Accounts Payable			404,694.04
Matured Interest and Dividends Unpaid			2,182,398.00
Matured Mortgage, Bonded and Secured Debt Unpaid			6,000.00
Other Working Liabilities			42,635.76
Total			$12,261,114.18
Accrued Liabilities not Due—			
Unmatured Interest and Sinking Fund Payments			$1,493,729.13
Taxes Accrued			72,000.00
Total			$1,565,729.13
Deferred Credit Items—			
Operating Reserves			$1,388,829.20
Liability on Account of Provident Funds			496,538.89
Other Deferred Credit Items			329,512.94
Total			$2,214,881.03
Appropriated Surplus—			
Additions to Property since June 30, 1907, through Income			$17,523,473.03
Reserves from Income or Surplus—			
Invested in Sinking Funds			31,321,700.07
Total			$48,845,173.10
Profit and Loss—			
Income Account			$46,230,662.67
Profit and Loss			41,941,882.03
Total			$88,172,544.70
Grand Total			$473,751,542.14

INCOME ACCOUNT.

OPERATING INCOME.

RAIL OPERATIONS—			
Operating Revenues:			
Revenue from Transportation:			
Freight	$57,740,418.62		
Passenger	21,083,418.74		
Excess Baggage	310,267.12		
Mail	2,368,447.34		
Express	2,578,810.37		
Milk	370,713.84		
Other Passenger Train	10,275.83		
Switching	1,220,351.07		
Special Service Train	39,925.84		
Miscellaneous Transport'n.	79,748.07	$85,802,376.84	
Revenue from Operations other than Transportation:			
Stat'n and Train Privileges	$8,573.40		
Parcel Room Receipts	7,565.97		
Storage Freight	40,278.08		
Storage Baggage	17,459.80		
Car Service	250,408.52		
Telegraph and Telephone Service	205,186.98		
Rent of Buildings and other Property	106,480.03		
Miscellaneous	152,636.16	$788,588.94	
Joint Facilities, Dr.		7,412.23	
Joint Facilities, Cr.		139,514.42	
Total Operating Revenues		$86,723,067.97	
Operating Expenses:			
Maintenance of Way and Structures	$13,541,030.39		
Maintenance of Equipment	14,294,032.69		
Traffic Expenses	1,528,114.63		
Transportation Expenses	29,020,384.11		
General Expenses	2,263,387.34	$60,646,949.16	
Net Operating Revenue			$26,076,118.81
OUTSIDE OPERATIONS:			
Revenue		$906,174.65	
Expenses		1,028,875.16	
Net Deficit from Outside Operations			$122,700.51
Total Net Revenue			$25,953,418.30
TAXES ACCRUED			3,303,058.11
Operating Income			$22,650,360.19
OTHER INCOME.			
Rents Accrued from Lease of Roads		$2,976.36	
Other Rents—Credits:			
Joint Facilities	$476,190.25		
Miscellaneous Rents	135,582.89	611,773.14	
Dividends Received on Stocks Owned or Controlled		768,342.00	
Interest Received on Funded Debt Owned or Controlled		550,122.93	
Interest on Other Securities, Loans and Accounts		217,829.72	$2,151,044.15
Gross Corporate Income			$24,801,404.34

DEDUCTIONS FROM GROSS CORPORATE INCOME.

Other Rents—Debits:			
Hire of Equipment—Balance	$478,776.14		
Joint Facilities	973,001.60		
Miscellaneous Rents	17,277.30	$1,469,055.04	
Interest Accrued on Funded Debt		8,547,309.04	
Other Interest		13,493.46	
Sinking Funds Chargeable to Income		657,978.58	
Extinguishment of Discount on Securities		6,814.44	$10,694,650.56
Net Corporate Income			$14,106,753.78

DISPOSITION OF NET CORPORATE INCOME.

Dividends declared on Stock:			
2 per cent, payable Sept. 25, 1911	$2,216,782.00		
2 per cent, payable Dec. 26, 1911	2,216,782.00		
2 per cent, payable March 25, 1912	2,216,782.00		
2 per cent, payable June 25, 1912	2,216,782.00	$8,867,128.00	
Appropriations for Betterments: Expended during the year..		3,944,216.08	$12,811,344.08
Surplus for the year			$1,295,409.70

FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.

Designation of Bond or Obligation.	Term. Date of Issue.	Term. Date of Maturity.	Total Par Value Authorized.	Total Par Value Outstanding.	Total Par Value Held by Company. In Treasury.	Total Par Value Held by Company. Pledged as Collateral.	Total Par Value not Held by Company. In Sinking Funds.	Total Par Value not Held by Company. In the Hands of the Public.	Interest. Rate.	Interest. When Payable.	Interest. Amt. Accrued During the Year.
MORTGAGE BONDS.											
C. B. & Q. R. R.:											
General Mortgage	1908	1958	$61,651,000	$61,651,000	$9,014,000	.....	.....	$52,637,000	4	M. & S.	$2,429,719.46
Illinois Division	1899	1949	50,835,000	50,835,000	384,000	.....	.....	50,451,000	3½	J. & J.	1,779,225.00
Illinois Division	1899	1949	34,165,000	34,165,000	189,000	.....	.....	33,976,000	4	J. & J.	1,366,600.00
Iowa Division Mortgage Sinking Fund Bonds	1879	1919	3,000,000	2,274,000	.....	.....	.....	2,274,000	5	A. & O.	113,712.47
Iowa Division Mortgage Sinking Fund Bonds	1879	1919	12,502,000	5,639,000	19,000	.....	.....	5,620,000	4	A. & O.	227,860.00
Nebraska Extension Mortgage Sinking Fund Bonds	1887	1927	29,441,000	22,543,000	316,000	$31,000	.....	22,196,000	4	M. & N.	911,586.68
B. & M. R. R. R. in Nebraska:											
Consolidated Mortgage Sinking Fund Bonds	1878	1918	13,751,000	13,613,000	109,600	.....	$10,103,800	3,399,600	6	J. & J.	816,780.00
Republican Valley R. R.:											
Mortgage Sinking Fund Bonds	1879	1919	2,643,000	932,800	6,200	.....	727,800	198,800	6	J. & J.	55,968.00
Tarkio Valley R. R.:											
Mortgage Bonds	1880	1920	430,000	30,000	.....	.....	.....	30,000	7	J. & D.	2,292.50
Nodaway Valley R. R.:											
Mortgage Bonds	1880	1920	388,000	31,000	.....	.....	.....	31,000	7	J. & D.	2,555.01
COLLATERAL TRUST BONDS.											
C. B. & Q. R. R.:											
Sinking Fund Bonds (Denver Extension)	1881	1922	7,968,000	7,310,200	351,000	.....	4,876,100	2,083,100	4	F. & A.	292,408.00
PLAIN BONDS.											
C. B. & Q. R. R.:											
Sinking Fund Bonds	1881	1921	4,300,000	3,667,000	237,000	.....	2,719,000	711,000	4	M. & S.	146,680.00
Plain Bonds	1883	1913	9,000,000	7,162,000	.....	.....	.....	7,162,000	5	M. & N.	401,921.92
Total	....	....	$230,074,000	$209,853,000	$10,625,800	$31,000	$18,426,700	$180,769,500	...	.....	$8,547,309.04

SINKING FUND ASSETS ON JUNE 30, 1912.
SECURITIES IN FUNDS.

Name of Fund and Security.	Par Value.	Cost or Book Value.	Cash in Fund.	Total.
SINKING FUND.				
C. B. & Q. R. R. 4 and 5 per cent Bonds of 1919 (Iowa Division)	.....	.....	$1,163.59	$1,163.59
C. B. & Q. R. R. 4 per cent Bonds of 1921	$2,719,000	$2,598,555.77	55,407.01	2,653,962.78
C. B. & Q. R. R. 4 per cent Bonds of 1922 (Denver Extension)	4,876,100	4,751,932.58	40,848.89	4,792,781.47
B. & M. R. R. R. in Nebraska Consolidated Mortgage 6 per cent Bonds of 1918	10,103,800	10,103,800.00	1,680.98	10,105,480.98
Republican Valley R. R. 6 per cent Bonds of 1919	727,800	727,800.00	611.79	728,411.79
Total	$18,426,700	$18,182,088.35	$99,712.26	$18,281,800.61

FREIGHT TRAFFIC MOVEMENT—ENTIRE LINE.

COMMODITIES.	Company's Material Excluded. Originating on this Road. Tons.	Received from Connections. Tons.	Total Freight Tonnage. Tons.	Per Cent.
PRODUCTS OF AGRICULTURE:				
Grain	3,064,675	486,384	3,551,059	11.79
Flour	538,280	128,694	666,974	2.21
Other Mill Products	213,803	48,631	262,434	.87
Hay	240,797	147,252	388,049	1.29
Tobacco	2,274	979	3,253	.01
Cotton	411	25,345	25,756	.09
Fruits and Vegetables	400,908	535,974	936,882	3.11
Other Products	63,896	95,227	159,123	.53
Total	4,525,044	1,468,486	5,993,530	19.90
PRODUCTS OF ANIMALS:				
Live Stock	1,635,121	194,943	1,830,064	6.08
Dressed Meats	192,712	7,452	200,164	.66
Other Packing House Products	139,606	6,999	146,605	.49
Poultry, Game and Fish	52,666	30,047	82,713	.27
Wool	9,809	11,347	21,156	.07
Hides and Leather	13,854	4,447	18,301	.06
Other Products	58,837	18,757	77,594	.26
Total	2,102,605	273,992	2,376,597	7.89
PRODUCTS OF MINES:				
Anthracite Coal	23,506	75,702	99,208	.33
Bituminous Coal	7,030,815	2,666,398	9,697,213	32.20
Coke	27,348	150,109	177,457	.59
Ores	202,804	340,571	543,375	1.80
Stone, Sand, etc.	1,423,820	202,982	1,626,802	5.40
Other Products	73,932	310,120	384,052	1.29
Total	8,782,225	3,745,882	12,528,107	41.61
PRODUCTS OF FORESTS:				
Lumber	216,820	1,365,531	1,582,351	5.25
Other Products	148,719	175,183	323,902	1.08
Total	365,539	1,540,714	1,906,253	6.33
MANUFACTURES:				
Petroleum and other Oils	137,188	244,267	381,455	1.27
Sugar	86,136	88,007	174,143	.58
Naval Stores	367	241	608	....
Iron, Pig and Bloom	5,058	146,721	151,779	.50
Iron and Steel Rails	19,925	113,603	133,528	.44
Other Castings and Machinery	206,749	353,048	559,797	1.86
Bar and Sheet Metal	22,223	150,464	172,687	.57
Cement, Brick and Lime	1,079,324	495,815	1,575,139	5.23
Agricultural Implements	159,251	59,713	218,964	.73
Wagons, Carriages, Tools, etc.	28,853	33,872	62,725	.21
Wines, Liquors and Beers	134,013	45,162	179,175	.60
Household Goods, etc.	73,995	39,849	113,844	.38
Other Manufactures	516,552	402,739	919,291	3.05
Total	2,469,634	2,173,501	4,643,135	15.42
MERCHANDISE	1,268,349	744,904	2,013,253	6.69
MISCELLANEOUS	508,991	141,647	650,638	2.16
Total Tonnage	20,022,387	10,089,126	30,111,513	100.00